Toronto Aquarium Feasibility Study

December 1984

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December 4, 1984

Mayor Arthur Eggleton
Office of the Mayor
City Hall
Toronto, Ontario
M5H 2N2

Dear Mayor Eggleton:

Re: Feasibility Study for a
Toronto Aquarium

On behalf of the study team, we are pleased to submit forty copies of the completed feasibility study for a proposed Toronto Aquarium.

The study outlines in detail the various sites available on the Central Waterfront and in the vicinity of Sunnyside Pavilion. The investigative findings of each site are measured on an evaluation matrix which used as its basis, availability, ownership, etc. Together with this evaluation we have described in detail the functional program of the Aquarium as well as its proposed exhibit theme. The study also develops an evaluation of the financial feasibility in terms of capital costs, projected attendance and annual operating costs.

Finally, we have addressed the question of fund raising in a peripheral manner by outlining in broad terms, a fund raising strategy.

We believe the study to be comprehensive and informative and would be pleased to offer any explanation or clarification upon your request.

Yours very truly,
BREGMAN + HAMANN Architects and Engineers

R. Javosky

Rudy V. Javosky
Partner
RVJ:ar
Encls.

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Prepared For:

The Corporation Of The
City Of Toronto

INDEX

1. INTRODUCTION

2. PROJECT DESCRIPTION

- 2.1 Goals and Concepts
- 2.2 Proposed Toronto Aquarium
- 2.3 Program of Spaces

3. LOCATION

- 3.1 Site Criteria
- 3.2 Selected Sites
- 3.3 Schematic Layout

4. ECONOMIC ANALYSIS

- 4.1 North American Aquaria
- 4.2 Visitor Attractions in Toronto
- 4.3 Toronto Aquarium Attendance Projections
- 4.4 Toronto Aquarium Financial Operating Characteristics
- 4.5 Alternative Site Analysis
- 4.6 Funding Considerations

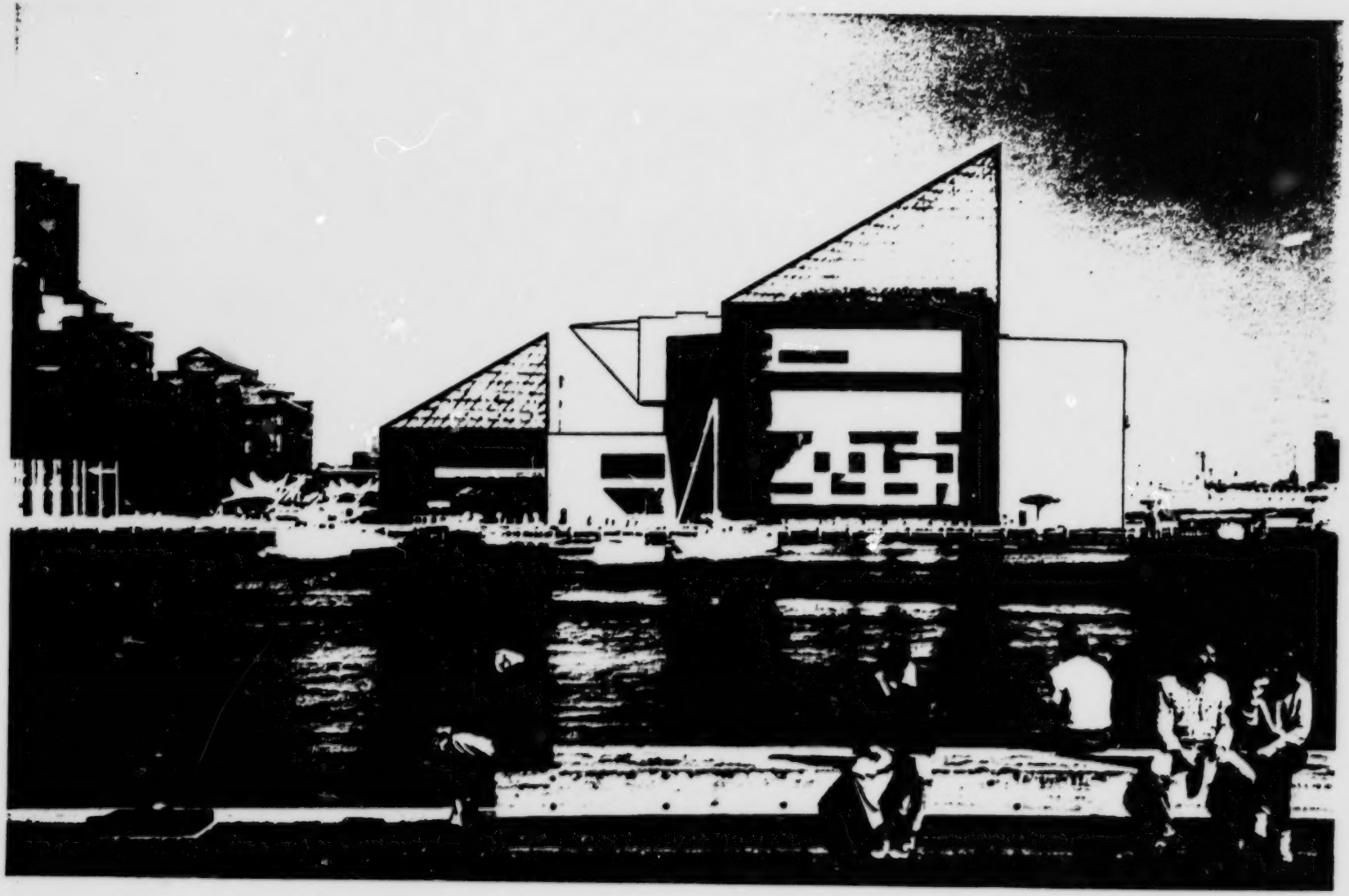
5. COST ANALYSIS

- 5.1 Capital Costs
- 5.2 Capital Budget

6. SUMMARY

APPENDIX

- A. Cost Data
- B. Research
- C. Credits



BALTIMORE AQUARIUM

1. Introduction

1. INTRODUCTION

Public aquaria throughout North America have proven themselves, in recent years, to be popular public attractions, and effective educational institutions.

Located on both coasts, and in diverse locations inland, they have demonstrated strong appeal to a full cross-section of the population they serve, including residents of local communities and surrounding regions, often drawing visitors from great distances. Their attendance by national and international travelers has in many cases made a significant contribution to the economy of their region.

But they are inherently expensive, both to build and to operate, and their costs cannot be expected to decrease. One factor causing costs to remain high is the public's growing awareness of the natural environment, of its fragility, of mankind's role in looking after it. As concerns grow for conservation of wild places, and for protection of animals in the wild, public expectations also increase with respect to any urban facilities that attempt to simulate those wild places, and to display wild creatures in captive settings.

To keep pace with rising expectations, and to maintain a significant role both in education, and in conservation, the public aquarium as a building type must meet the challenge by continually improving the quality of its offerings. Since costs will keep pace with and perhaps exceed the rate of inflation, and since funds in the current economic climate will not be easily raised, financial feasibility has been a question for this study, not an assumption.

The authors of this study recognize that Toronto will benefit from the arduous process of developing an aquarium, and from the reality of its presence in the City, only if the proposal is conceptually and financially sound from the start.

This study first attempts to define a public aquarium that would be appropriate to Toronto, in terms of scope, character and content, and then tests its feasibility through an analysis of possible sites, probable construction costs, probable operating costs, and projected income. Also included is an outline of alternative possible sources of funds.

2. Project Description

2.1 Goals and Concepts

Exhibition Purposes

Historically, there have been various methods of presenting zoological collections whether terrestrial or aquatic. At one time it was satisfactory to present an exhibit of specimens much as one would display a miscellaneous collection of oddities or curiosities. In fact, this was more or less how P.T. Barnum presented his zoological collection in the mid-1800's.

As aquatic collections became institutionalized, they began to be arranged first according to environmental requirements such as freshwater, brackishwater and saltwater; cold, temperate and tropical, etc. In recent years there has been an evolution toward communicating information to other than students of the subject, and an increasing emphasis on an educational presentation to the general public.

An effective zoological exhibition must concentrate on conveying a concept, theme, or biological principle through the medium of live animals. Illustrative subjects could include adaptation, animal behavior, evolution, symbiosis, migration, territoriality, reproduction, etc. However, people don't go to an aquarium or zoo only to be educated. They also go to relax and be entertained by viewing beautiful, fascinating, or curious specimens. For example, whereas the concept of locomotion could be demonstrated by using a minnow, it is more fascinating and attractive if demonstrated with a sea horse or some other exotic representative. Predation could be demonstrated with a large mouth bass, but how much more exciting with an octopus or a shark.

Habitat Emphasis

Whereas public aquaria have in the past tended to be organized for educational purposes with large numbers of relatively small fish tanks, and others for entertainment purposes with large performing areas for trained mammals, an Aquarium in Toronto has another opportunity, which is emerging as a trend in the zoo and aquarium field. This study proposes that Toronto might develop a facility that concentrates on accurate simulation of natural

environments, with habitat exhibits designed on a relatively large scale.

Improved habitat conditions are a major benefit for the captive animals, and they also provide a more powerful and participatory experience for the public. Public access, in an urban setting, to diverse natural environments, has proven to be effective in both entertainment and educational terms.

Ecological Orientation

In the illustrative program proposed here, the Aquarium would have a unifying ecological emphasis, making clear to the public the interaction between animals and their environment, and the interdependence of all forms of life in ecosystems. One means of conveying the principles of ecology throughout the proposed Aquarium would be to point out, with diverse examples, how and why survival is achieved in the delicate balance of nature. As on land, life in the aquatic realm has survival as its primary goal.

The various live displays found in aquaria are often attractive but also meaningless without focus or explanation. Unless concepts are put forth and clearly explained, the display is only one of interesting animals and places. The uninitiated must be guided in this fascinating world of water. The untrained eye needs to be directed. Curiosity must be aroused, with discovery its reward.

Man and the Biosphere

The proposed exhibition program, with its emphasis on ecology, and on communication of the mechanics of survival, presents another important opportunity; the communication of man's role in the ecosystems of our planet, of his upsetting influence, of his responsibility to preserve all life, to guarantee continuity for future generations.

Mixed Museum Techniques

The proposed Toronto Aquarium is conceived with a strong complementarity of living exhibits and non-living

exhibits, combining in mutual reinforcement. Habitat exhibits with their live animals can become all the more dramatic and instructive if reinforced by the kinds of interpretive exhibits traditionally found in natural history museums, science centers, or world's fairs. Examples are graphic displays, projected still images, recorded sound, and the use of artifacts. In addition, a substantial use is proposed of video programs and special exhibition films, demonstrating animal behavior in the wild, located adjacent to, or nearby, the same or related live animals on display. For example, film clips on video of shark behavior in the sea, can be adjacent to a tank containing the same species.

Recreation/Education

The proposed facility is on the one hand conceived to have a very entertaining character, designed for maximum appeal and with enough variety and excitement to generate repeat visitation. On the other hand it is designed to offer a rich menu of learning experiences, making clear basic biological principles to the more casual visitors, and with enough substance and depth of treatment to appeal to the more sophisticated or dedicated visitors. Through its exhibits and diverse educational programs, the Aquarium can become an important resource for all of the schools in the region.

Changing Exhibits

Many aquaria find themselves with inflexible exhibit galleries, unable to offer the public major exhibits that can be temporary or changed frequently. The proposed Aquarium would have substantial space for rotating exhibits, and for special presentations of subjects of local, regional, and national interest.

Research

Facilities for research are included within the program, so that the Aquarium might attract highly qualified staff and research scientists, and contribute to its own success with husbandry, health care and breeding, and contribute to general knowledge in such areas as evolutionary relationships, life history, disease processes, behavior, responses to various environmental

perturbations such as noise, pollution, etc. and population biology.

Collaboration with other Institutions

The proposed Aquarium program has been conceived to complement other institutions in the area. Some overlaps will inevitably occur with individual exhibits at the Metro Toronto Zoo, but their character, and their relationship to other exhibits, will be totally different. The Zoo and the proposed Aquarium will be in a position to collaborate on many projects, including educational programs and resources, research programs, field trips, seminars, conferences, etc. Similarly, the Aquarium can collaborate in diverse ways with the Ontario Science Center and other institutions in the region concerned with the sciences and education.

Co-operative Programs

North American art museums, science centers, natural history museums, and in recent years zoos and aquaria, have found numerous opportunities for co-operation and exchange of information and ideas, through publications, joint research efforts, conferences and seminars. Facilities for these activities are proposed for Toronto, plus a capability for producing and exchanging exhibits designed to go on tour to sister institutions in Canada, the U.S., and other countries.

2.2 Proposed Toronto Aquarium

Canadian Emphasis

A Toronto Aquarium provides a unique opportunity to bring to Canada and her visitors the complex and varied aquatic environments which exist along her shores, inland along rivers and streams, and above and below the surfaces of its uncountable ponds and lakes.

The second largest land mass in the world, this immense transcontinental confederation is bordered by three oceans. The MacKenzie and St. Lawrence Rivers are among the world's longest, and the Great Lakes are among the world's largest.

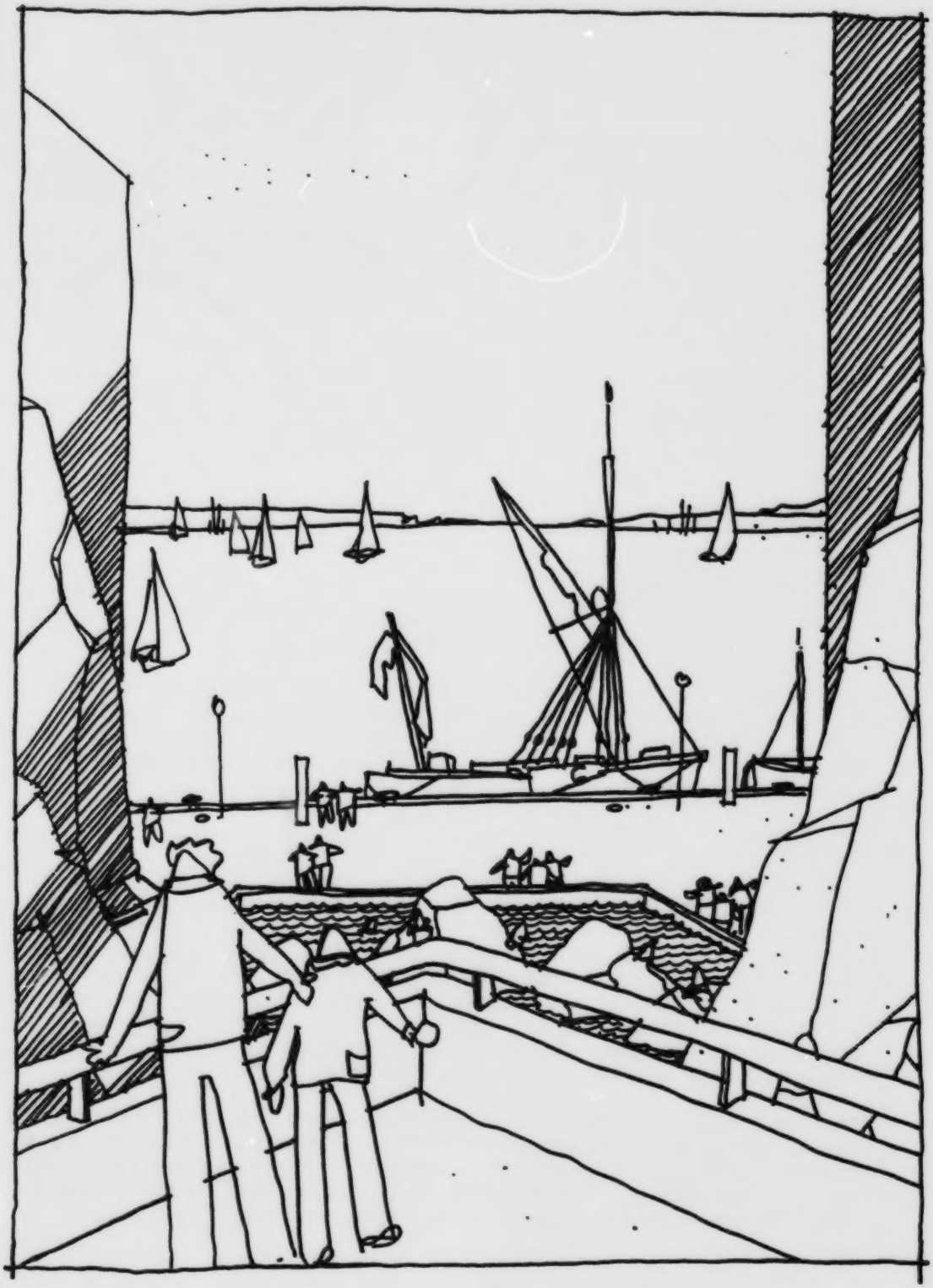
The diversity of the Canadian environments, from the warm waters off the west coast, to the tundra and polar ice cap, to the cliffs of Newfoundland, suggests an aquatic exhibition powerful enough to stand on its own. It is the intent of the proposed program outlined in this study to celebrate these Canadian environments and to make visible the complex systems which operate in each.

This focus on the whole of Canada, reinforced by comparison to other parts of the world through secondary exhibits, seems particularly appropriate to both Toronto and to Ontario. No other aquarium in Canada has done this on a substantial scale.

Exhibition Content

The proposed exhibition program displays a wide range of life, both aquatic and terrestrial. In addition to fishes, mammals, aquatic birds, inverterbrates, amphibians, reptiles, insects and plants will all play an important role. Careful programming and design of the exhibits can communicate how the natural systems work and how these creatures have adapted. The exhibits can be a window on our land and waters to promote conservation and make clear the interdependence of all living things.

The animals and the exhibits described in the following pages are meant to create a vision of the nature, the style and the character of the Aquarium. It is expected that during the design development and design refinement stages, many of the specifics may be altered substantially.



Transcontinental Tour of Canada

The aquarium experience is conceived as a linear transcontinental tour which begins on the west coast of British Columbia and travels inland across the mountains to the plains, to the Great Lakes, to the St. Lawrence River, the Maritimes, and finally to the waters of Hudson Bay and the Arctic.

Comparisons and Contrasts

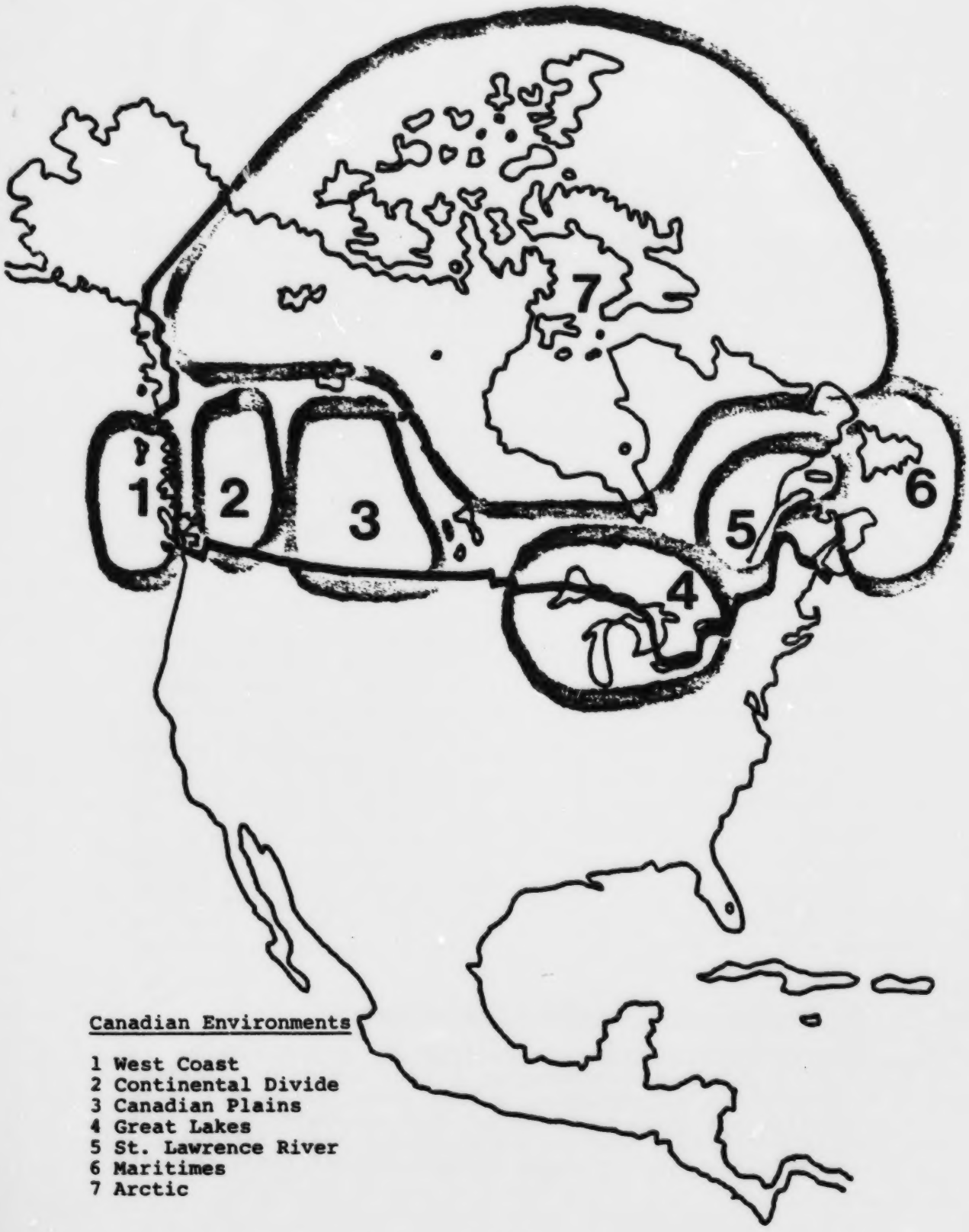
As a comparison to these northern habitats, a series of tropical exhibits is proposed which can bring to Toronto the exotic waters of South America, including perhaps a mangrove swamp, an equatorial rainforest, and the wonder of the coral reef. In addition, an Antarctic penguin exhibit is proposed as a complement to the Arctic gallery.

Outdoor Slice Concept

Whereas coral reef exhibits are always an exciting part of any aquarium experience, the focus of this conceptual program is placed on a great slice through Canada. Visitors would encounter a natural place open to the sky, a place of rocks and cliffs, of quiet pools and the sound of rushing water. The slice is first encountered at the entrance plaza where Steller's sea lions play in a large pool amidst rocky islands. As the visitor moves through the interior of the building, he or she returns again and again to this outdoor slice, each time encountering a new habitat located within a daylit fjord cut through the center of the building; sea otters, puffins, polar bears, walruses, ringed seals, and perhaps beluga whales. Each of these major species is seen out of doors, from eye level, or above, and from indoor exhibit galleries, underwater.

Preliminary Outline/Canadian Environments

The following sequential description might suggest to some a building designed as a tour of major Canadian environments in sequence, ending with the Arctic. In reality, the proposed program is intended to allow the visitor to visit the environments of Canada, following a flexible, self-guided tour, oriented at all times through



Canadian Environments

1 West Coast
2 Continental Divide
3 Canadian Plains
4 Great Lakes
5 St. Lawrence River
6 Maritimes
7 Arctic

reference maps, and encouraged at all times to make comparisons between one ecosystem and another. Many of the exhibits described will also seem quite separate from each other, when described in words. The intent, however, is that when encountered in the building, most will seem to be combined in strongly defined habitat groupings.

1. WEST COAST

Relatively warm waters of the Japanese current sweep across the Pacific bringing great rains along the Coast Mountains, as much as 760 cm per year. These coastal waters are rich with seal life and as diverse as any place in the world. The Pacific octopus, sea otters, anemones, starfish, king crabs, pacific salmon, seal lions and halibut are some of the primary inhabitants of this rich environment.

Illustrative Exhibits:

Outdoors, prior to entering the Aquarium, visitors may watch Steller's sea lions cavort on rocky islands and in the exhibit pool. Beyond, within the Aquarium, visitors may glimpse a continuation of this outdoor environment as rocks and cliffs create a slice of natural rocky shoreline.

Inside, the rocky West Coast gallery once again overlooks the sea lions. Sea otters are now seen close-up swimming on the surface as well as viewed underwater. Adjacent to the sea otters, a rocky habitat agitated by wave action provides a glimpse at the rich invertebrate life which inhabits the subtidal zone of British Columbia's Georgia Straits. Giant sea anemones, orange sea pens, purple sea urchins, and bright red starfish present a dazzling array of sedentary marine life amongst which small fish dart.

A Pacific octopus lurks in his rocky grotto while king crabs tiptoe across a sandy bottom in two additional popular exhibits.

A large Ocean community tank give visitors a glimpse into the Gulf of Alaska, a rocky reef with sand bottom. Here the larger fish of the West Coast are displayed such as Pacific halibut, sablefish, rockfish, ling cod and flounder, the basis of a large commercial fishery.

The visitor begins to move inland to the upper reaches of the Fraser River, a fast moving salmon stream. The stream bank is visible and several varieties of Pacific salmon are seen resting in deep pools between cascades. The amazing story of these prolific fish is presented both in the exhibit and in extensive graphics.

2. CONTINENTAL DIVIDE

Fed by 5m of snowfall annually, the streams and lakes of Alberta and British Columbia are environments rich in animal and insect life. Beaver, otter, reptiles, rainbow trout, grayling, burbot, goldeye, and mountain whitefish abound in this region. These streams and rivers run from the Columbia Icefield, on the Continental Divide and rush in three directions to the Pacific, Arctic and Atlantic Oceans.

Illustrative Exhibits:

Eastern slope mountain streams feed the Mackenzie and Saskatchewan Rivers that flow north and east. The cold waters of these streams abound in Kamloop trout, grayling, mountain suckers, northern squawfish and mountain whitefish. A fast flowing mountain stream interrupted by a placid pool will present these frequently sought specimens.

The Lesser Slave Lake is the setting for an exhibit of fish typical of the foothills of the eastern slope, burbot, trout-perch, goldeye, sculpins and lake trout.

An alpine pond in the process of conversion to a meadow is the setting of a beaver pond with a cut-away section of the beaver lodge and a diorama backdrop of the mountains in the rear.

3. CANADIAN PLAINS

Water on the plains is scarce and is found in small ponds, streams, and marshes. Yellow perch, sculpin and varieties of suckers and bullhead are common. The Plains lie within the Central and Mississippi flyways and the wetlands attract waterfowl by the thousands such as the Canada goose and the snow goose migrating to and from their breeding ground on the Arctic tundra.

Illustrative Exhibits:

The Saskatchewan River basin drains from the foothills across the plains east to Lake Winnipeg. The river is home to yellow perch, longnose suckers, trout-perch, silver redhorse, black bullhead and the predaceous walleye, a popularly sought after sportfish found in the deeper reaches of the river. A deep river habitat will feature the walleye and large representatives of its community.

4. GREAT LAKES/ONTARIO WATERS

These important fresh water giants cover nearly 246,050 km^2, the largest expanse of fresh water on Earth. The smallest, Lake Ontario, is the world's 14th largest. Lake Superior is second only to the land-locked Caspian Sea. These waters, slow to respond to weather changes, affect the major weather patterns to the east.

The Province of Ontario encompasses all of Canada's Great Lakes shoreline and nearly one fourth of the country's population.

Once thriving with lake trout and other gamefish, the Lakes are struggling with pollution and with the influx of the sea lamprey and alewives from the Atlantic which have changed the balance of the Lake's fish populations. Lake Superior, at the headwaters of the system, is the largest, deepest and clearest of the Lakes.

Illustrative Exhibits:

Visitors approach the Lakes gallery with a view of a lake edge with fallen trees and vegetation. A muskellunge, one of the great predators, rests amidst grasses. Moving to a deeper pool of water, a Lake Ontario community tank, 7.6 m in diameter displays cisco, lake sturgeon, lake trout, coho salmon, channel catfish and white perch.

Two smaller tanks display paddlefish, a fish once found in the Lakes, and sea lampreys, the troublesome newcomer from the Atlantic by way of the canals. Graphics will describe the economic and ecological impact of the sea lamprey and efforts to eradicate them.

Hundreds of lake herring, alewives, and rainbow smelt school in a nearby exhibit. With their silver sides flashing within a black void, they make a startling display of schooling behavior. Lake trout, bass, muskellunge and other large predators of the lakes thrive on these prolific forage fish of the Great Lakes.

5. ST. LAWRENCE RIVER/ONTARIO WATERS

Great Lakes water flows past the Thousand Islands and into the St. Lawrence River 110,000 km from the Atlantic Ocean at the rate of 8,182,960 liters per second. The River re-oxygenates the abused Great Lakes water. These waters at the Gulf of St. Lawrence once provided feeding grounds for great whales and walruses.

Illustrative Exhibits:

The St. Lawrence River exhibit presents two tanks, one with sea-run brown trout, white perch and guillback, the other a tank with the migrating American eel and Atlantic salmon.

Nearby a series of small tanks display reptiles, amphibians, small fish and invertebrates of the Ontario back-waters. Crayfish, crappie, darters, frogs, turtles, dace and mud minnows will be seen as a series of jewel exhibits which isolate the smaller specimens from the large predators of the community tanks.

6. MARITIME PROVINCES

Newfoundland, Canada's easternmost outpost in the North Atlantic, has been a fishing center for archaic groups nearly 4000 years ago, for the Vikings, and the European fishing fleets which followed John Cabot in 1497.

Great glaciers scoured the island of rubble and boulders and deposited them for 322 km offshore, forming the great undersea shelf known as the Grand Banks. Here cod, turbot, and flounder abound in the nutrient rich waters of the Labrador Current. These nutrients, carried south from the Arctic floor, form the base of a vast food chain ending with seals, sharks and the great whales.

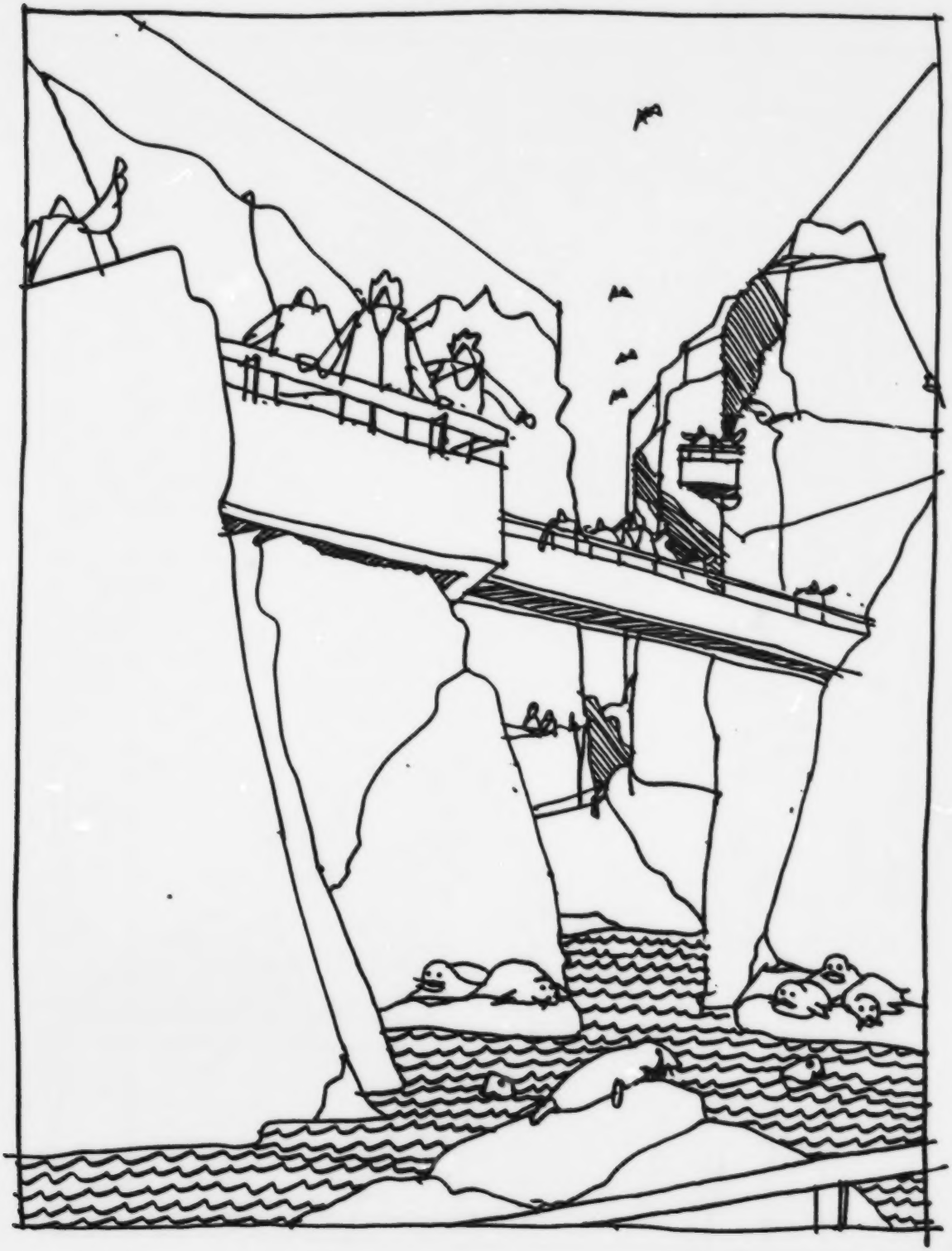
Along the cliffs, great colonies of sea birds; puffins, murres, gannets, kitti wakes and auks flourish by the thousands.

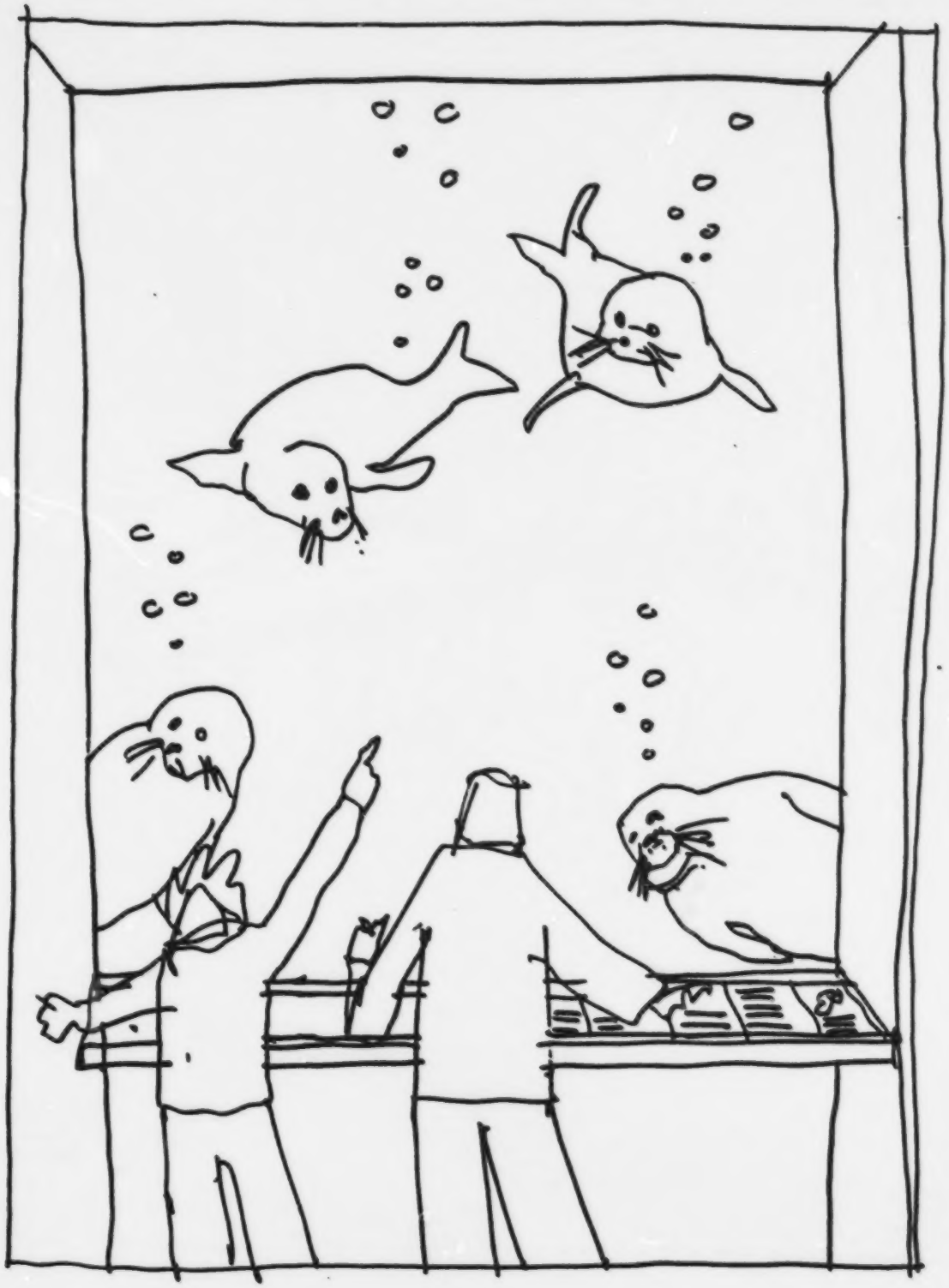
Illustrative Exhibits:

Visitors encounter a cliff wall with ledges and nesting crevices populated by puffins and murres, as many as two dozen very active birds. A sleuce with a waterfall serves as a slide into a pool where these aquatic birds may be seen "flying" under water.

Adjacent to the cliff is a glimpse below the surface into a shallow section of the rocky coast. Wolf, fish, tomcod, sea ravens, sculpins and invertebrates move in an out among the rocks and crevices. In a separate tank, a 14 kg lobster may be seen. Children and adults may enter an active area carved out of this rocky coastal environment where starfish, crabs, sea urchins and anemones may be examined close up and in some cases held.

Moving from the coast to the deeper waters of the shelf, visitors will look into an expansive Grand Banks exhibit alive with cod, pollock, halibut, hake, skates and flounder, the life blood of the eastcoast commercial fisheries.





7. ARCTIC

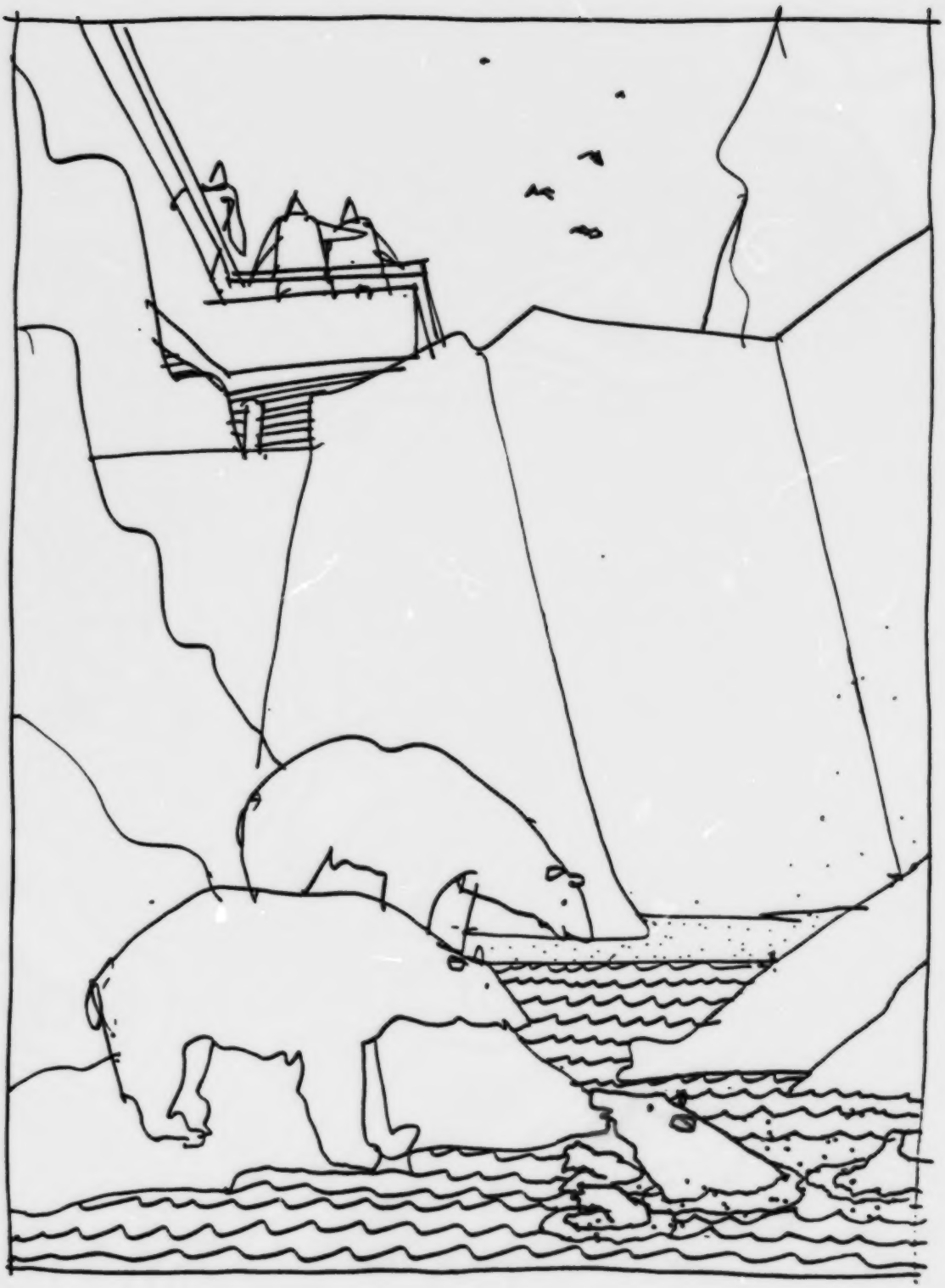
The Arctic is a wilderness of ice and tundra. Its surface contains vast quantities of water locked in ice for most of the year. However, with less than 25.4 cm of precipitation per year, this region may be classified as a desert.

Centimeters below the surface, permafrost may reach depths of 609.6 meters. Temperatures range from -21°C in winter to 26.7°C in summer. Like the desert this hostile environment has a rich variety of plant and animal life which has often ingeniously adapted to the extremes of nature.

This land of ice flows, lakes and ponds, too numerous to count or name, is a fragile land still recovering from the effects of the last glacial age. Shallow ponds and lakes may be devoid of life forms higher than insects, while deeper waters support a greater variety of aquatic life. Muskrats, succulent plants, great northern pike, Arctic grayling, lake herring, whitefish, and Arctic char, the northernmost freshwater fish, survive in lakes and streams. The walrus, polar bear, seals and whales make this land a dramatic water environment. In summer it is a nesting ground for the Canada goose, snow goose and other waterfowl, while wet, flat land supports a multitude of wading birds. The amazing Arctic tern migrates during the northern winter 16,000 km to waters off Antarctica. The ringed seal, living year-round below the Arctic ice, is the world's most northern mammal.

Illustrative Exhibits:

Harp and Ringed seals swim actively in a large expanse of water surrounded by a rocky shore. These animals may be seen from above and later from below the water surface. In another section of this rock strewn landscape, polar bears playfully swim and dive below the surface, and are seen underwater.



A Hudson Bay exhibit tank presents the fish of the Churchill River. Arctic char, grayling, cisco and trout-perch swim in a shallow rocky stream exhibit. The tundra lies at the edges of the ice cap, a land once covered by glacial ice. Water captured in frozen ponds and lakes is everywhere. Temporary ponds, frozen solid during most of the year, are shown in their summer and winter condition to dramatize the environment. Fairy shrimp, frogs and insects will be displayed in mini tanks.

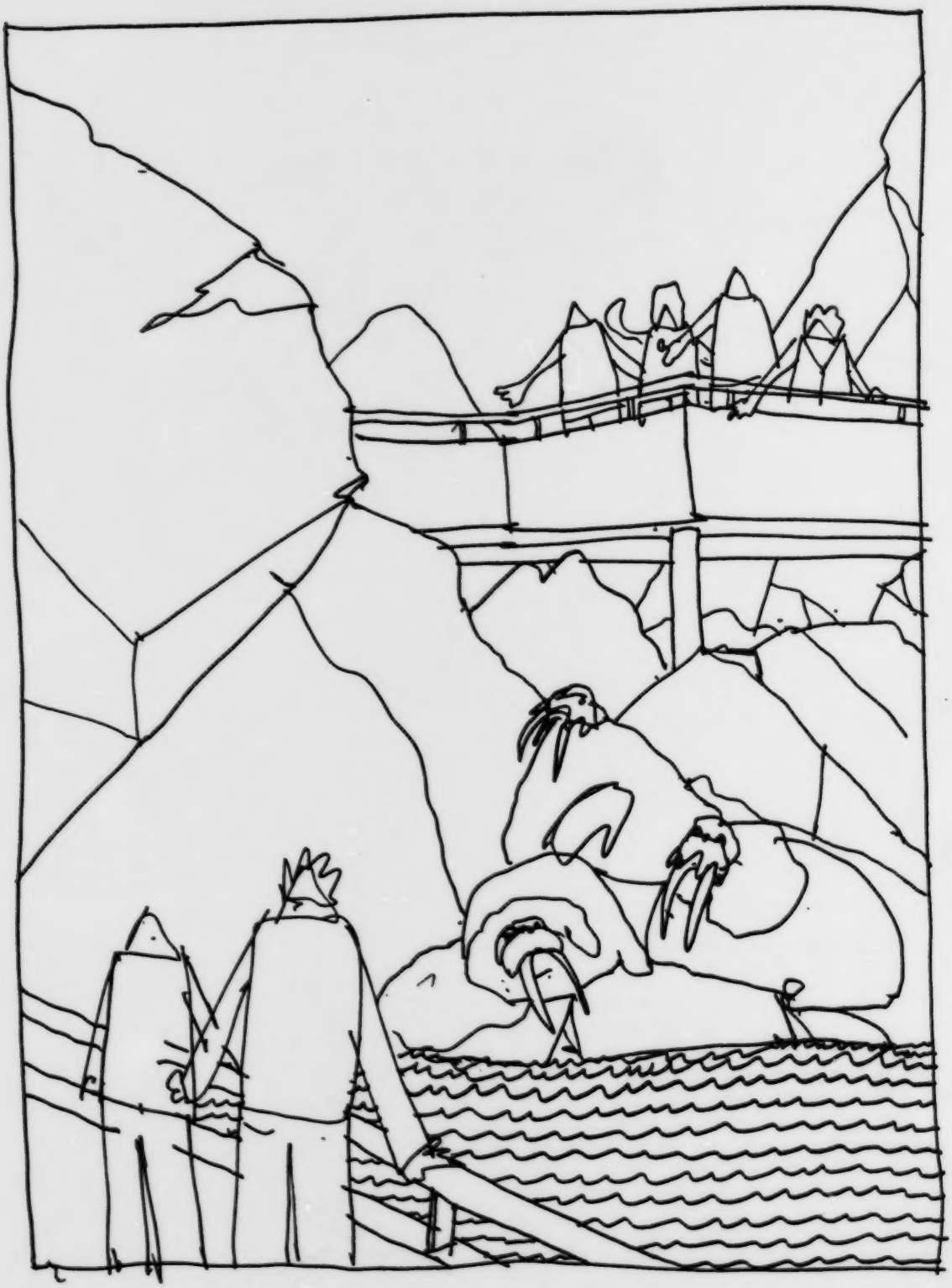
Deeper ponds and lakes, however, are home to a wide range of life such as spottail shiners, lake chub, emerald shiners and the three spine sticklebacks.

The Mackenzie River drains north across the tundra to the Arctic Ocean. It is one of Canada's largest rivers and home to the northern pike, the premier gamefish of the north, as well as the inconnu, the largest of whitefish, growing to 28.6 kilograms.

The tundra is also the terminus for millions of waterfowl that migrate to this area via the major flyways for the purpose of nesting during the short arctic summer. A major and dramatic audio-visual display will convey the magnitude of this event, as no captive live exhibit could accomplish.

The beluga, or white whale of the north, is found throughout the Arctic circle and along the east coast of Canada including the Gulf of St. Lawrence and the St. Lawrence River. Next to the polar bear, it may be the most recognizable symbol of the Arctic. Frequenting estuaries and rivers, the beluga whale has also been a prime source of meat for the native peoples of the north.

If optimum conditions can be established in the Aquarium, a major exhibit of beluga whales at the far end of the environmental slice through the building will complement the Steller's sea lion exhibit at the entrance. Viewed from both above and below water, the beluga whales will be presented in a spacious natural setting of a rocky fjord-like bay in the Arctic Circle. Seeing these magnificent marine animals in natural non-performing captivity will give visitors appreciation for all whales and dolphins that inhabit Canadian waters. A major graphic



Comparative Exhibits

8 Antarctica
9 South American River
10 Southeast Asian Mangroves
11a Atlantic Coral Reef
11b Indo-Pacific Coral Reef
12 Open Ocean

or video presentation will make visitors aware of the many species of marine mammals that live in the Canadian arctic.

8. ANTARCTICA

As a comparative exhibit to the Arctic, this exhibit will display penguins, flightless birds adapted to life in water. Living in vast colonies, and only in the southern hemisphere, these birds are free of any major predators. As with the animals of the Arctic, penguins of the Antarctic must be able to withstand an enormous temperature range, from winter cold as low as -15.5°C to the summer highs of 32°C.

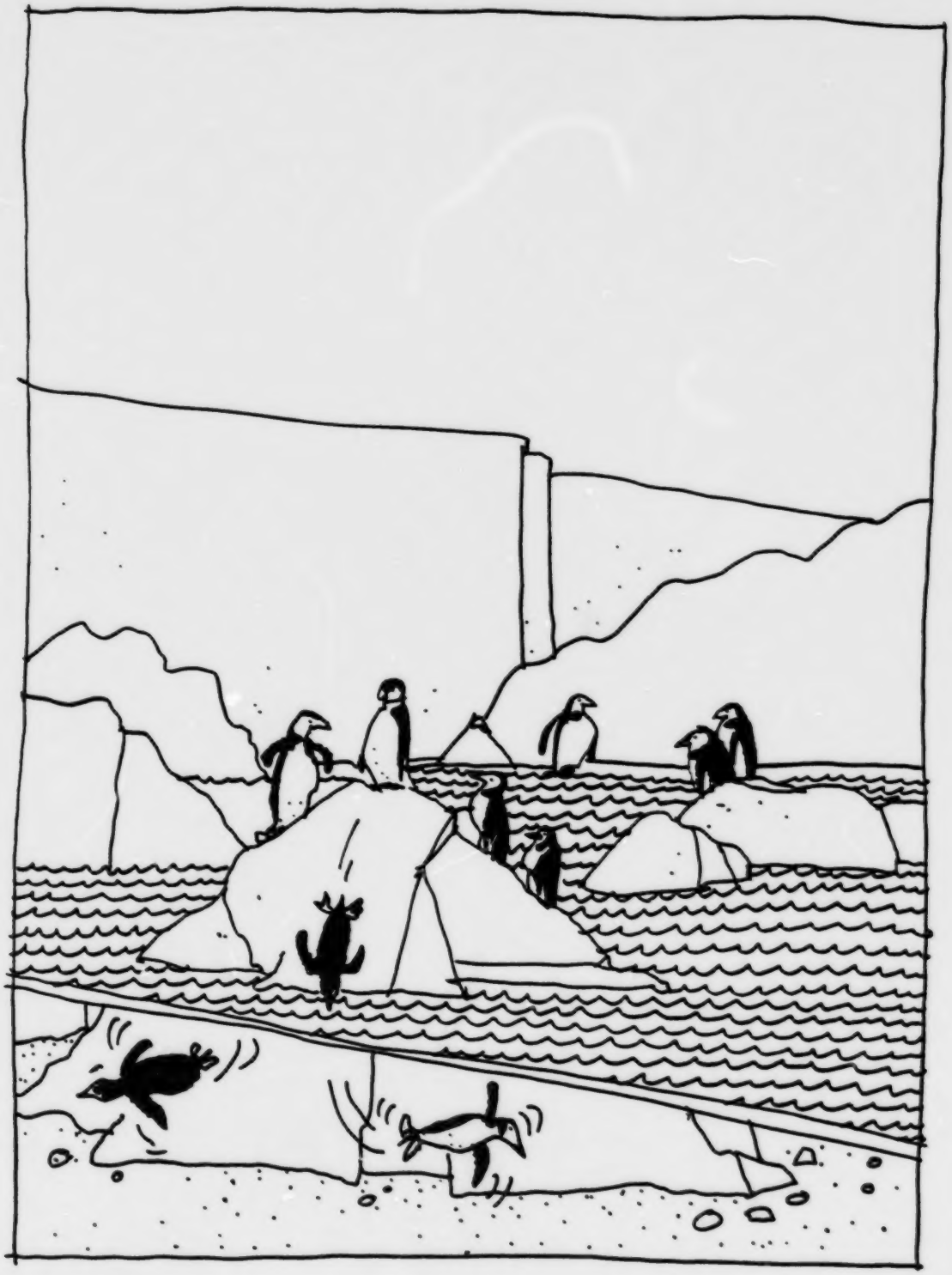
Illustrative Exhibit:

"Where are the penguins?", a common question often asked about the Arctic, will be answered and will correct the common misbelief that penguins live at the north pole.

The exhibit will closely follow the Arctic gallery and serves as a comparison exhibit. The antarctic exhibit provides visitors a series of coves and overlooks from which to view the penguin antics. Ever popular because of their "formal" appearance, wobbly walk and gracefulness in the water, penguins are an excellent complement to the cliff dwelling sea birds of the sea cliff exhibit. The Aquarium's colony plays on a series of islands, the foreground to a great ice cliff at the rear of the diorama. Penguins may be seen swimming underwater as well as climbing the rock islands.

9. SOUTH AMERICAN RIVER

The Amazon Valley is a rich environment with diverse animal life both in this rain forests and its rivers. There are nearly 2000 different fishes in these waters, three times as many species as in all of North America's fresh waters.



For contrast, diversity and number, only the coral reef ecosystems rival the great rivers of South America's Amazon rain forests.

Illustrative Exhibits:

A view into a main tributary of the Amazon River presents some of the largest freshwater fish in the world, the Arapaima that grows to 2.4 m and the Pacu, 18 kg vegetarians that feed on fruits and nuts that fall into the water. The above and below water presentation of this tropical river is a dramatic contrast to the earlier presentation of northern river communities. Smaller exhibits within the habitat will present adult specimens of fish commonly imported from South America for the home aquarium hobby. An electric eel exhibit will also correct many misunderstandings and inspire even greater appreciation for the diversity of adaptations for survival.

10. SOUTHEAST ASIAN MANGROVES

The warm tropical seas of the world don't always meet the shore at white sandy beaches or at cliffs of rocks. Where tropical streams enter the oceans we find mangrove marshes where the fresh and saltwater mix. This habitat may be classified as a tropical marsh, its entangled root system with its many avenues of escape becoming a nursery at the edge of the sea.

Illustrative Exhibit:

The visitor will view this exhibit from both above and below the water's surface. These forests at the edge of the sea provide a habitat for many interesting and fascinating forms of aquatic life such as mudskippers, fish that hop across mud flats and climb tree roots; archerfish that shoot their prey off branches, or out of the air with pellets of water spit from their mouth, and many other interesting creatures.

11. CORAL REEF

Coral reefs are significant geological formations. In fact, they are among the few structures built by living organisms that are visible from outer space. The extensive coral reefs of the tropical Pacific, Indian and Atlantic Oceans present the most diverse environments on this planet. Visitors to the Aquarium will have the opportunity to compare Pacific and Atlantic reef communities with the Canadian coastal exhibits described earlier.

Illustrative Exhibits:

Indo-Pacific Coral Reef

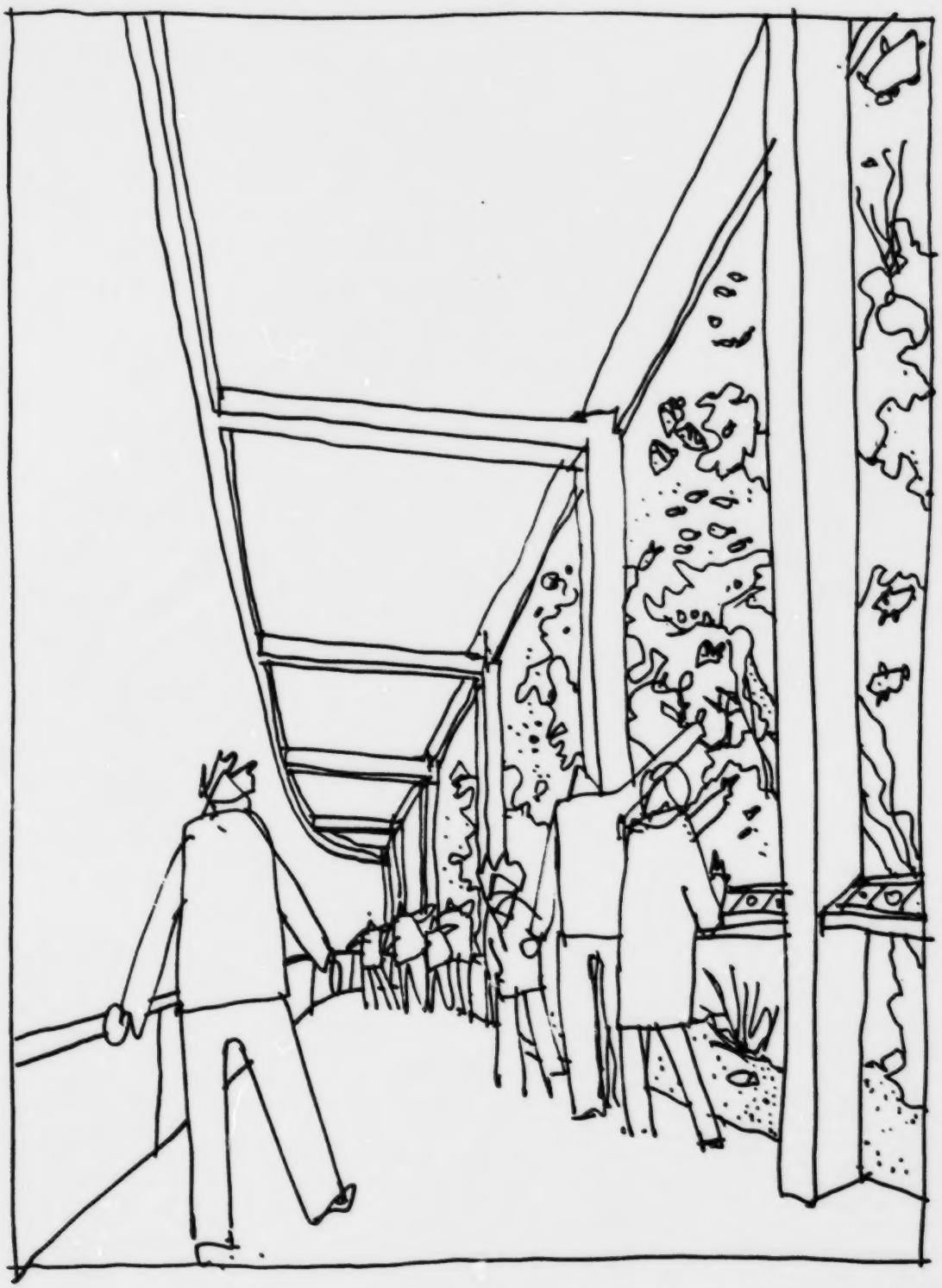
The contiguous reefs of the Indian and Pacific Oceans encompass a vast area of the tropical seas of the world and are home to some of the most elaborately shaped and colored creatures imaginable. The Indo-Pacific coral reef exhibit will attempt to present a representative sample of the diverse fish life of these extensive reefs in a naturalistic reef setting.

Atlantic Coral Reef

The major coral reef formations of the Atlantic are found in the Caribbean Sea and the Gulf of Mexico. Though less expansive than the coral reefs of the Pacific, the Atlantic coral communities are just as productive. Trigger fish, angelfish, surgeon fish and groupers will delight the visitors with their unusual shapes, behavior, and colors. An adjacent isolated exhibit will exhibit selected pieces of the living coral whose skeletons make up the reef.

12. OPEN OCEAN

Among the most misunderstood of all predators on land or in the sea is the shark. Visitors to the aquarium might consider their visit incomplete without sharks. Techniques developed in recent years allow for the transport and long term maintenance of impressive-size sharks even at inland aquaria. A shallow coastal environment would present temperate and tropical species of sharks in a manner such that the visitors could appreciate the gracefulness and



beauty of these often maligned creatures. Respect and not fear will be communicated.

13. AQUATIC THEATRE

The visitor will enter a small theatre space seating approximately 100 people for a 6 to 8 minute multi-screen audio-visual presentation. This show will allow visitors to encounter animals not able to be seen in an aquarium environment as well as habitats only able to be experienced in an exhibit through photography and film.

Here, seals may be seen below Arctic ice and great whales may be followed underwater and their songs may be heard. An infinitely rich diversity of behavior in the aquatic world may be explored, and behavior among birds, mammals, reptiles, amphibians, insects and microscopic life that cannot be displayed in the Aquarium may be presented in a powerful and memorable way.

14. MAN AND THE ENVIRONMENT

The aquarium visitor, as he completes his tour of the proposed exhibition, will have been exposed to a wide range of natural systems found in Canada, and to a comparative sampling of those found in other parts of the world. A concluding exhibit is proposed that will demonstrate the finiteness of Canada's natural resources, and the fragility of ecosystems everywhere on Earth. The dangers of destruction and depletion will be made clear, including specific problems such as reduction of the game fish population, pollution of the Great Lakes, acid rain and others. This exhibit is conceived to stimulate greater awareness of mankind's necessary role in the stewardship, rather than abuse, of our planet's natural environment.

2.3 Program of Spaces

This program of space needs is the basis of the Aquarium conceptual design. It recognizes a building of approximately 12,150 m^2 with exhibits and supporting facilities capable of attracting and accommodating a projected annual attendance of 750,000-900,000 visitors with an average visit of two hours.

The program lists space requirements and gross areas on a room-by-room basis. It does not specifically address the variety of mechanical spaces. This area is given as a single figure and is relative to other similar facilities.

This program is intended to provide direction and scope for the proposed Toronto Aquarium and should be utilized for preliminary planning purposes, and should be treated as the beginning of a process of future development and will, therefore, be subject to considerable revision.

BUILDING AREA SUMMARY (m^2)

Program Categories

1.	Exhibits and Public Circulation		5,900 m^2
	Occupied by exhibits	2,430	
	Occupied by support space	2,505	
	Occupied by the public	965	
II.	Lobby and Public Facilities	875.0 m^2	
III.	Auditorium	290.0 m^2	
IV.	Education	95.0 m^2	
V.	Curatorial Areas	420.0 m^2	
VI.	Administration/Staff	760.0 m^2	
VII.	Service	315.0 m^2	
VIII.	Maintenance	235.0 m^2	
IX.	Food Service	210.0 m^2	
X.	Research	260.0 m^2	
XI.	Mechanical Systems	1,860.0 m^2	
XII.	General Building Circulation	930.0 m^2	
	Total	6,250.0 m^2	
	TOTAL PROPOSED GROSS AREA	12,150 m^2	

Aquarium Program (m^2)

I. EXHIBITS AND PUBLIC CIRCULATION

Although listed below as individual exhibits, many will be combined within larger habitat groupings.

Exhibit Description	Exhibit Space	Reserve Space	Life Support	Public Space
A. CANADIAN ENVIRONMENTS				
1. West Coastal				
Steller's Sea Lions(D) (exterior)	325.0	45.0	65.0	75.0
Sea Otters (D)	70.0	18.0	27.0	35.0
Salmon Stream (D)	35.0	9.0	12.0	20.0
Gulf of Alaska Community	18.0	14.0	18.0	20.0
Rocky Coast Subtidal (D)	18.0	9.0	7.0	20.0
Octopus	4.5	2.5	3.0	10.0
King Crab	4.5	2.5	3.0	10.0
	475.0	100.0	135.0	190.0
2. Rocky Mountains/Continental Divide				
Mountain Stream	7.0	5.0	2.5	10.0
Mountain lake (D)	18.0	23.0	22.5	5.0
	25.0	28.0	25.0	15.0
3. Piedmont				
Stream (Saskatchewan River)	18.0	20.0	24.0	5.0
4. Great Lakes/Ontario Waters				
Great Lake	18.0	10.0	14.0	18.0
Paddlefish	11.0	5.0	5.0	5.0
Muskellunge	4.0	3.0	2.0	4.5
Lamprey	2.0	1.0	1.0	4.5
Schooling Fish	11.0	5.0	5.0	18.0
	55.0	24.0	27.0	50.0

5. Ontario Waters				
St. Lawrence Seaway	18.0	9.0	4.5	18.0
Fallfish	2.0	1.0	1.0	5.0
Pond	22.0	22.0	22.5	18.0
Amphibians	5.0	3.0	1.0	5.0
Stream	5.0	5.0	9.0	18.0
	52.0	40.0	38.0	64.0
6. Maritime				
St. Lawrence Seaway	20.0	20.0	24.0	20.0
Grand Banks	20.0	9.0	7.5	20.0
Rocky Coast (PEI) (D)	27.0	23.0	24.0	20.0
Lobster	4.0	2.0	1.0	7.0
Tide Pool (D)	19.0	3.0	4.5	4.5
Harp/Ring Seals (D)	90.0	36.0	27.0	54.0
	180.0	95.0	88.0	165.0
7. Arctic				
Walruses (D)	185.0	45.0	24.0	45.0
Beluga Whales	185.0	37.0	56.0	45.0
Polar Bears (D)	325.0	45.0	27.0	45.0
Hudson Bay-Churchill River	20.0	18.0	22.0	20.0
Capelin	4.0	3.0	2.0	5.0
Mackenzie River/Northern Pike	4.0	3.0	2.0	5.0
Temporary Pond (D) summer	4.0	3.0	1.0	5.0
Mosquitoes (D)	3.0	1.0	1.0	5.0
	730.0	155.0	135.0	175.0
B. COMPARATIVE ENVIRONMENTS				
1. Antarctic (South Pole)				
Penguins (D)	110.0	28.0	18.0	45.0

(D) Indicates a diorama or habitat in most cases providing above- and below-water viewing.

C.	TROPICAL EXHIBITS				
1.	Amazon River	30.0	15.0	14.0	18.0
2.	Mangrove Swamp	5.0	2.0	1.0	7.0
3.	Coral Reef (Atlantic/Pacific)	185.0	25.0	45.0	140.0
4.	Open Atlantic Sharks	110.0	18.0	40.0	90.0
		330.0	60.0	100.0	255.0D.
	MISCELLANEOUS EXHIBITS				
1.	Changing Exhibit Gallery	180.0			
2.	Man and the Environment	110.0			
3.	Aquatic Mini-Theatre	90.0			
	Projection Room	50.0			
		430.0			
E.	EXHIBIT WORK SPACE	1,390.0			
	Exhibit Space		1,975.0		
	Reserve Space		550.0		
	Life Support Space		590.0		
	Public Space		965.0		
	Miscellaneous Exhibits		430.0		
	Exhibit Work Space		1,390.0		
	Total Item 1 (A-E)		5,900.0		
II.	LOBBY AND PUBLIC FACILITIES				
	Queue	75.0			
	Ticket Area	45.0			
	Lobby	90.0			
	Coat Room	45.0			
	Lobby Storage	25.0			
	Public Toilets	150.0			
	First Air Room	20.0			
	Wheelchair/Cart Storage	20.0			
	Gift Shop	280.0			
	Gift Shop Storage	110.0			
	Gift Shop Office	15.0			
		875.0			
III.	AUDITORIUM				
	Hall	225.0			
	Preparation Room	25.0			
	Projection Room	15.0			
	Storage	25.0			
		290.0			

IV. EDUCATION

Workshop	70.0
Storage	25.0
	95.0

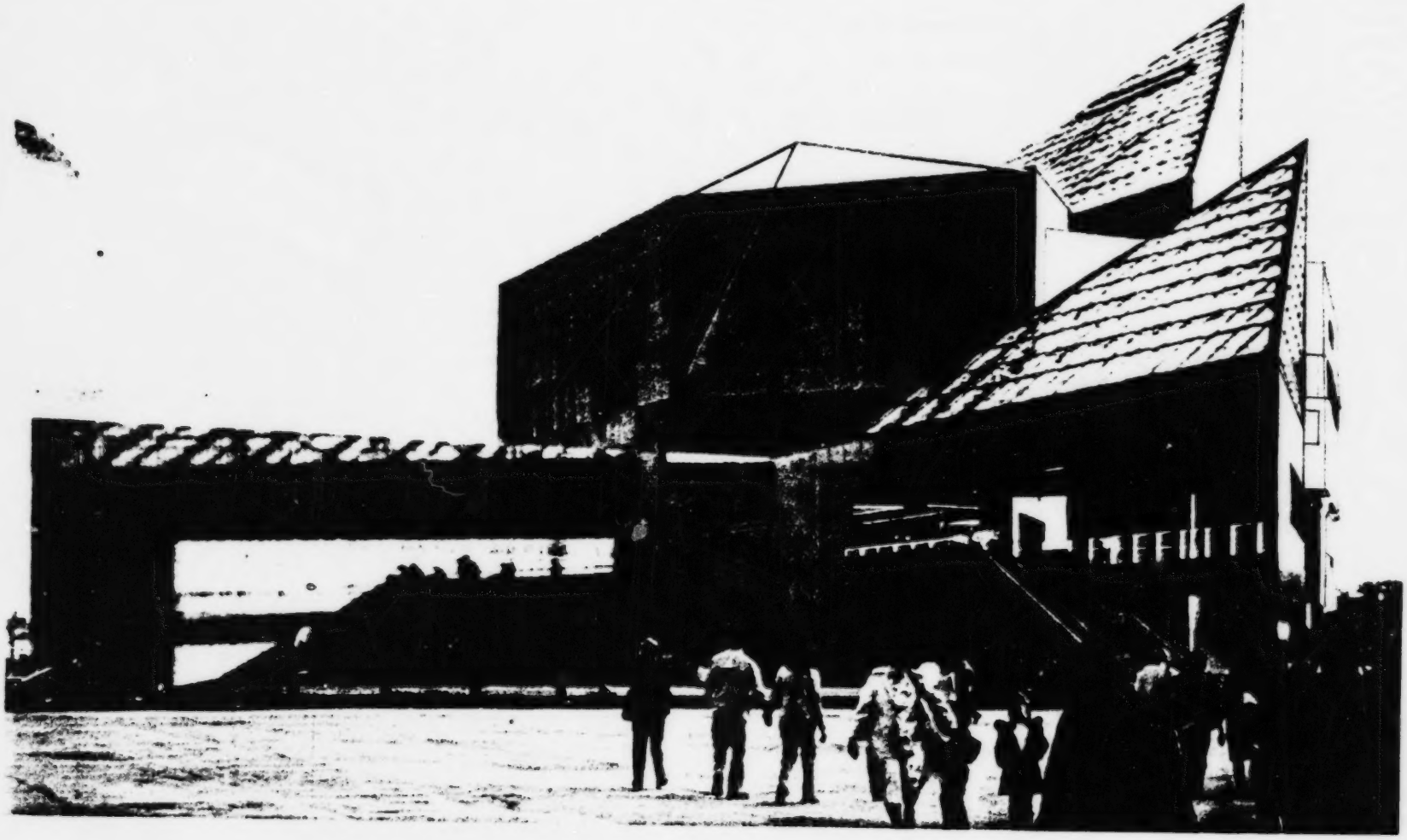
V. CURATORIAL AREAS

Laboratory	45.0
Senior Aquarist	15.0
Marine Biologist	15.0
Food Preparation	45.0
Freezer/Cooler	45.0
Cutting Room	20.0
Storage	28.0
Diver Locker Rooms (2 x 150)	28.0
Diver Toilet Rooms (2 x 150)	28.0
Quarantine Rooms	143.0
	420.0

VI. ADMINISTRATION/STAFF

Executive Director	27.0
Executive Secretary	20.0
Waiting Area	20.0
Conference Room (12)	36.0
Associate Director	30.0
Associate Director's Secretary	15.0
Switchboard	15.0
General Secretarial Area (3)	42.0
Library	27.0
Comptroller	20.0
Accounting Office (3)	27.0
Records Storage	42.0
Cash Room	20.0
Curator's Office	14.0
Curator's Office	14.0
Marketing Director	14.0
Marketing (3)	27.0
Membership	14.0
Education Director	14.0
Education (3)	27.0
Volunteers (3)	27.0
Design Studio	45.0
Dark Room	20.0
Audio/Visual Room	27.0
Staff Lunch Room	32.0
Kitchen	20.0
Staff Toilets	88.0
Staff Lockers	36.0
	760.0

VII.	SERVICE		
	Loading (exterior)	110.0	
	Loading (interior)	29.0	
	Receiving	140.0	
	Trash Storage (exterior)	36.0	
		315.0	
VIII	MAINTENANCE		
	Chief Engineer's Office	20.0	
	Central Control Room	33.0	
	Custodial Office	14.0	
	Custodial Storage	28.0	
	General Storage	140.0	
		235.0	
IX.	FOOD SERVICE		
	Dining	140.0	
	Kitchen	28.0	
	Storage	22.0	
	Trash Storage	10.0	
	Food Service Office	10.0	
		210.0	
X.	RESEARCH		
	Research offices (2 x 150)	30.0	
	Research Area	230.0	
		260.0	
XI.	MECHANICAL SYSTEMS	1,860.0	
XII.	GENERAL BUILDING CIRCULATION	930.0	
	Aquarium Exhibits (Item I)		5,900.0
	Aquarium Support (Items II thru XII)		6,250.0
	TOTAL PROPOSED GROSS AREA:		12,150.0



BALTIMORE AQUARIUM

3. Location

3.1 Site Criteria

The process of potential site selection was preceded by the establishment of a series of site criteria. This provided a framework within which the sites could be identified in the first place and subsequently studied, graded and evaluated.

AREA:

- requirement for an adequate site area for the proposed facility plus room for expansion at a future date.

LOCATION:

- location sought in the central area of waterfront allowing the facility to be as accessible as possible, both visually and physically.

CONTEXT:

- aim toward compatibility of existing and planned adjacent uses, such as commercial, retail and recreational; an environment which would give the Aquarium an opportunity to have symbiotic relationship with its surroundings.

ROAD:

- site with good road access allowing easy vehicular approach with minimal passage through congested traffic paths.

PARKING:

- site with good sources of public parking or with potential for parking to be built economically.

PUBLIC TRANSPORTATION:

- site presently well serviced by public transportation or a site where new routes could be introduced with relative ease.

ZONING:

- zoning designation which already allows the erection of a recreational/institutional facility or a designation which could be rezoned with relative ease.

AVAILABILITY/COST:

- site whose owners are in a position to make the land available to the Aquarium at minimal cost and who would view the Aquarium as having a beneficial effect on the remainder of the site.

WATER:

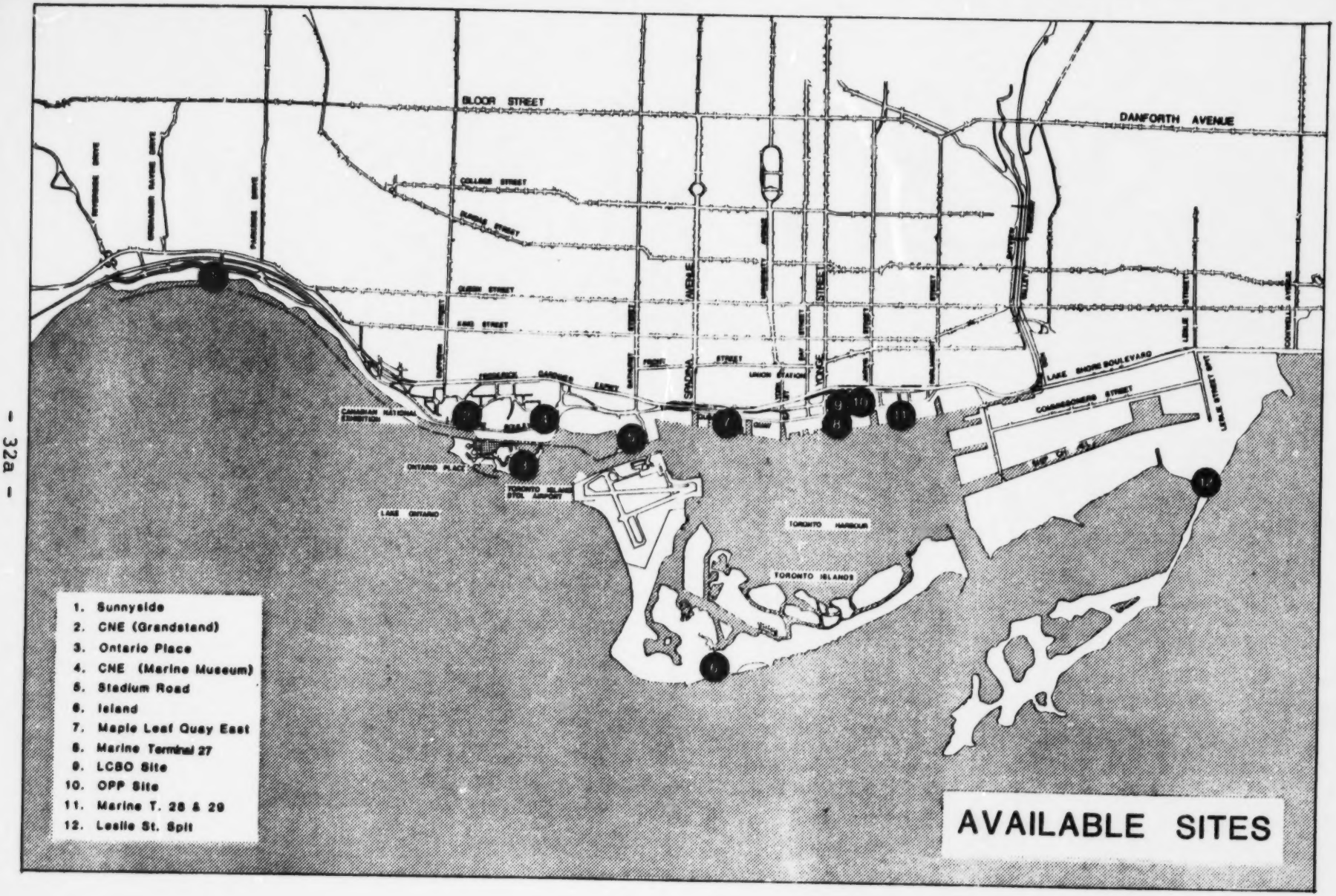
- emphasis on proximity to the Lake, the harbour and all water-oriented activities.

VISIBILITY:

- site location in relation to surrounding building mass and the general potential it would furnish for the locating of the Aquarium in such a way that it can become a landmark building, easily observable from many vantages.

IDENTITY:

- undesirability of a site context where the Aquarium would have difficulty establishing its own identity and would become identified as part of another recreational entity.


BLOOR STREET
DANFORTH AVENUE
COLLEGE STREET
QUEEN STREET
KING STREET
YONGE STREET
SPADINA AVENUE
LAKE SHORE BOULEVARD
CANADIAN NATIONAL EXHIBITION
ONTARIO PLACE
TORONTO ISLAND STOL AIRPORT
LAKE ONTARIO
TORONTO HARBOUR
TORONTO ISLANDS
1. Sunnyside
2. CNE (Grandstand)
3. Ontario Place
4. CNE (Marine Museum)
5. Stadium Road
6. Island
7. Maple Leaf Quay East
8. Marine Terminal 27
9. LCBO Site
10. OPP Site
11. Marine T. 28 & 29
12. Leslie St. Spit
AVAILABLE SITES

3.1.1 EVALUATION OF AVAILABLE SITES

All site owners, or their representatives, were interviewed and the issues concerning the criteria, the opportunities and the drawback of each site were discussed at some length. The following chart represents a brief synopsis of the evaluations. Each component was given a maximum point value of 1 with location, availability/cost and water given a maximum score of 2 to properly underscore their significance.

	Area-1pt.	Location-2pts.	Context-1pt.	Roads-1pt.	Parking-1pt.	Public Transp.-1pt.	Zoning-1pt.	Avail./ Cost-2pts.	Water-2pts.	Siting-1pts.	Identity-1pt.	Total-14pts.
1. Sunnyside	1.0	1.5	0.25	0.75	0.5	0.25	1.0	2.0	2.0	0.75	0.75	10.75
2. CNE (Grandstand)	1.0	0.75	-	0.75	1.0	1.0	1.0	1.5	-	-	-	7.0
3. Ontario Place	0.5	1.0	0.75	0.5	1.0	0.5	1.0	1.0	2.0	0.5	-	8.75
4. CNE (Marine Museum)	1.0	0.75	-	0.75	1.0	1.0	1.0	1.5	-	-	-	7.0
5. Stadium Road	1.0	1.5	0.5	0.5	0.75	0.75	0.25	1.0	2.0	0.75	0.75	9.75
6. Island	1.0	-	-	-	-	-	-	1.0	2.0	0.5	-	4.5
7. Maple Leaf Quay East	0.75	2.0	1.0	0.75	0.5	0.75	1.0	2.0	2.0	1.0	1.0	12.75
8. Marine Terminal 27	1.0	2.0	1.0	1.0	0.75	1.0	1.0	1.0	2.0	1.0	1.0	12.75
9. LCBO Site	1.0	-	-	1.0	0.5	0.75	0.5	-	-	-	-	3.75
10. OPP Site	1.0	-	-	1.0	0.5	0.5	0.5	-	-	-	-	3.5
11. Marine T. 28 & 29	1.0	-	-	1.0	1.0	-	-	1.5	2.0	0.5	0.5	7.5
12. Leslie St. Spit	1.0	-	-	1.0	1.0	-	-	1.5	2.0	0.5	0.5	7.5

3.2 Selected Sites

Based on the above assessments and reinforced by interviews and discussions, it was concluded that the two best sites are Maple Leaf Quay East and Marine Terminal 27. Two other sites, Sunnyside Pavilion and Stadium Road, were identified as potentially suitable locations but were found to have some serious drawbacks.

The two lesser sites shall be briefly dealt with first, and discussion on the two primary sites will follow.

3.2.1 SUNNYSIDE PAVILION

AREA:

The actual amount of land available in the vicinity of the Pavilion, would be adequate for the Aquarium's purposes. However, land configuration being in fact a lengthy green belt (extending from Ontario Place to the Humber River) with a maximum depth of ± 120 m, the siting of the Aquarium would be awkward. The bulk of the facility and its outdoor support space would break the continuity of the belt acting as a barrier to the park system in that location.

LOCATION:

This is a location which although central in relation to the City as a whole, is removed from the presently evolving nodes of recreational activity in the central waterfront area.

CONTEXT:

The proposed site would be located west of Sunnyside Pavilion and occupy land within the Sunnyside and Sir Casimir Gzowski Parks. Viewed in its entirety, this area forms the southern edge of the High Park system although separated from it by the Lakeshore Blvd. and the Gardiner Expressway. Presently the park is well used for passive recreation such as walking, sun-bathing, cycling, picnicking, etc.

SUNNYSIDE PAVILION SITE

SUNNYSIDE PAVILION SITE

The general area does not have any existing facilities such as restaurants, shops or other institutional entities. The Aquarium therefore would have to operate in isolation, receiving no support from the surrounding network. Such a scenario would call for an in-depth re-evaluation of projected attendance figures as well as a re-evaluation of expected revenues and financial viability.

It is however very likely that with time, the Aquarium would act as a catalyst, attracting further development to the area, perhaps even rejuvenating it to the same level of activity which it enjoyed in the 1920's as the Sunnyside Beach Amusement Park.

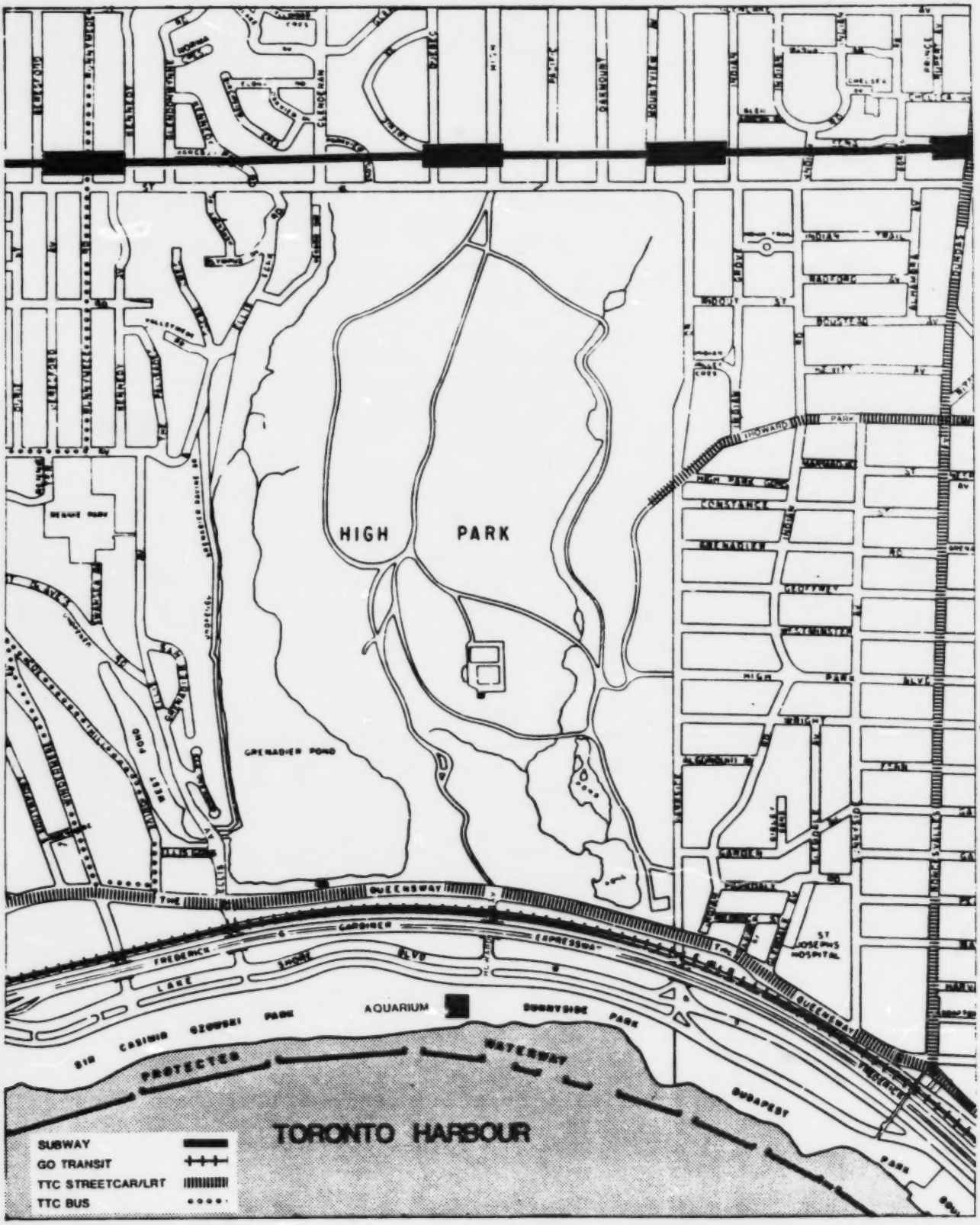
The conclusion therefore is that by locating the Aquarium in this area, the visitors would benefit from the initial opportunity of enjoying the park-like setting, away from the hurly-burly of the central waterfront. The drawback would be the slow dissolution of this same park into an amusement area akin to Harbourfront and the resultant loss to the City of this natural resource.

ROADS:

Lakeshore Boulevard will continue to be a very heavily travelled six-lane arterial in the vicinity of the site. Design and operational problems will make it difficult--but not impossible--to provide ingress from the east (a left turn) and egress to the west (a left turn).

Assuming that the Aquarium is located virtually opposite the intersection of Lakeshore Boulevard and Howard Avenue, there is a potential to reach the site from Queensway, a major arterial which is the continuation of the King and Queen Streets corridor.

This link would also make it possible to reach the site directly from the north via Howard Avenue. However, this would require a traverse of High Park, which would be disadvantageous in terms of encouraging motor vehicle travel within the park. Consequently, the use of Parkside Drive as the principal route between the north and the site could be encouraged by means of "trail blazer" signs, but this will always remain a rather awkward connection.



SUNNYSIDE PAVILION SITE **TRANSPORTATION OPTIONS**

PARKING:

Using the figures in this report prepared by Economics Research Associates a peak parking accumulation of between 324 and 389 autos is forecast for a 12 hour daily operation. In using these numbers to indicate the parking supply required, five to ten percent should be added, in order to account for the inevitable vacancy factor, even at times of peak use, reflecting the effect of autos leaving and entering stalls. This would result in a theoretical parking demand of, say, 350 to 425 stalls.

Assuming that few, if any, other major land uses which will generate significant parking demand will be close by, and assuming that the site will afford some "elbow room" for surface parking, it is estimated that the site will experience a "short fall" of approximately 200 or 250 parking spaces. As the building of an independent garage structure does not appear economically feasible, an alternative may be the creation of surface parking on lands located on the other side of the Gardiner Expressway and owned by Metro. A serious drawback to this solution is the distance involved and the costs associated with building a satisfactory underpass/overpass.

In this connection, it should be mentioned that fewer than 200 parking stalls are currently available in all of Sunnyside Park and the east end of Sir Casimir Gzowski Park, and that some portion of this modest supply could well be eliminated by the aquarium structure itself.

PUBLIC
TRANSPORTATION:

The site is marginally well served by the Queen-Humber streetcar route which follows the Queensway. A stop is provided at Howard Avenue. Unfortunately, this route is not particularly convenient for the bulk of the Metropolitan Toronto population, in terms of net travel time and distance relating to the site in question, which is located on an extremity of the T.T.C. system.

Whereas express, charter, and "special" bus services could be routed along Lakeshore Boulevard to serve the site, no improvement in either the configuration or operation of the public transit system is currently being proposed.

The GO Transit Lakeshore Line presently passes the site, and proposals have been made to provide a Sunnyside station on the new GO-ALRT line at some future date. The time span under discussion is in the order of ten to twenty years and therefore very long term. Should these plans materialize, this site would have very good access to public transporation.

ZONING:

The land is presently zoned "G", and the Aquarium would fit within the definition of uses allowed in that district.

AVAILABILITY/COST:

The land falls within the jurisdiction of the Department of Parks and Recreation, City of Toronto. Discussions to date indicate that under suitable arrangements land could be made available at no cost to the Aquarium.

WATER:

The site is directly adjacent to the water.

VISIBILITY:

As there are no surrounding structures in this area the Aquarium would be visible from many vantages, however as it is located at some distance from the central waterfront it would only be observable by those people passing in its vicinity and would miss the opportunity of announcing its presence to the thousands of people who during the summer months, sail, ride the ferries or walk on the Quays of the Inner Harbour.

IDENTITY:

At the outset the Aquarium's identity would be associated with Sunnyside but its own strength of presence would quickly emerge and establish it as its own landmark destination.

3.2.2 STADIUM ROAD (BATHURST QUAY)

AREA:

The amount of land which could be made available to the Aquarium would be sufficient to accommodate the proposed program.

LOCATION:

The proposed site would be at the foot of Stadium Road on Bathurst Quay. This location is somewhat removed from the central harbour recreation nodes, however the location of the Aquarium on this site would create a linking element between the central harbour and Ontario Place and CNE to the west.

CONTEXT:

The land to the west of Stadium Road is occupied by three Yacht Clubs, all of which are slated for relocation along land to be reclaimed on the Western Channel break-water. Immediately to the east side will be a municipal park and further on a parking garage to be built for Island Airport users. To the north, separated by additional park space, Harbourfront plans to build low-rise non-profit housing.

It was felt that with the anticipated changes, the site would contain many of the ingredients required for the success of an Aquarium. The garage, the park and the marina were seen as sympathetic and supportive neighbours.

Offsetting these benefits would then be the area's lack of restaurants, shops and commercial spaces all of which are considered significant in attracting visitors and providing them with an extended entertainment experience.

Additionally, the presence of low rise residential uses in the area is seen as a potential detriment, but with appropriate road design and manipulation of the park as a buffer, satisfactory separation could be achieved.

ROADS:

The site would be accessible via Bathurst Street, Queens Quay (extended) and Stadium Road. Bathurst Street will be

STADIUM ROAD SITE (BATHURST QUAY)

STADIUM ROAD SITE (BATHURST QUAY)

widened south of Lakeshore Boulevard following the completion of the extension of Queens Quay to Bathurst , and dual left turn lanes will be provided to handle the very heavy northbound-to-westbound left turn forecast at Bathurst/Lakeshore following full "build-out" of Harbourfront.

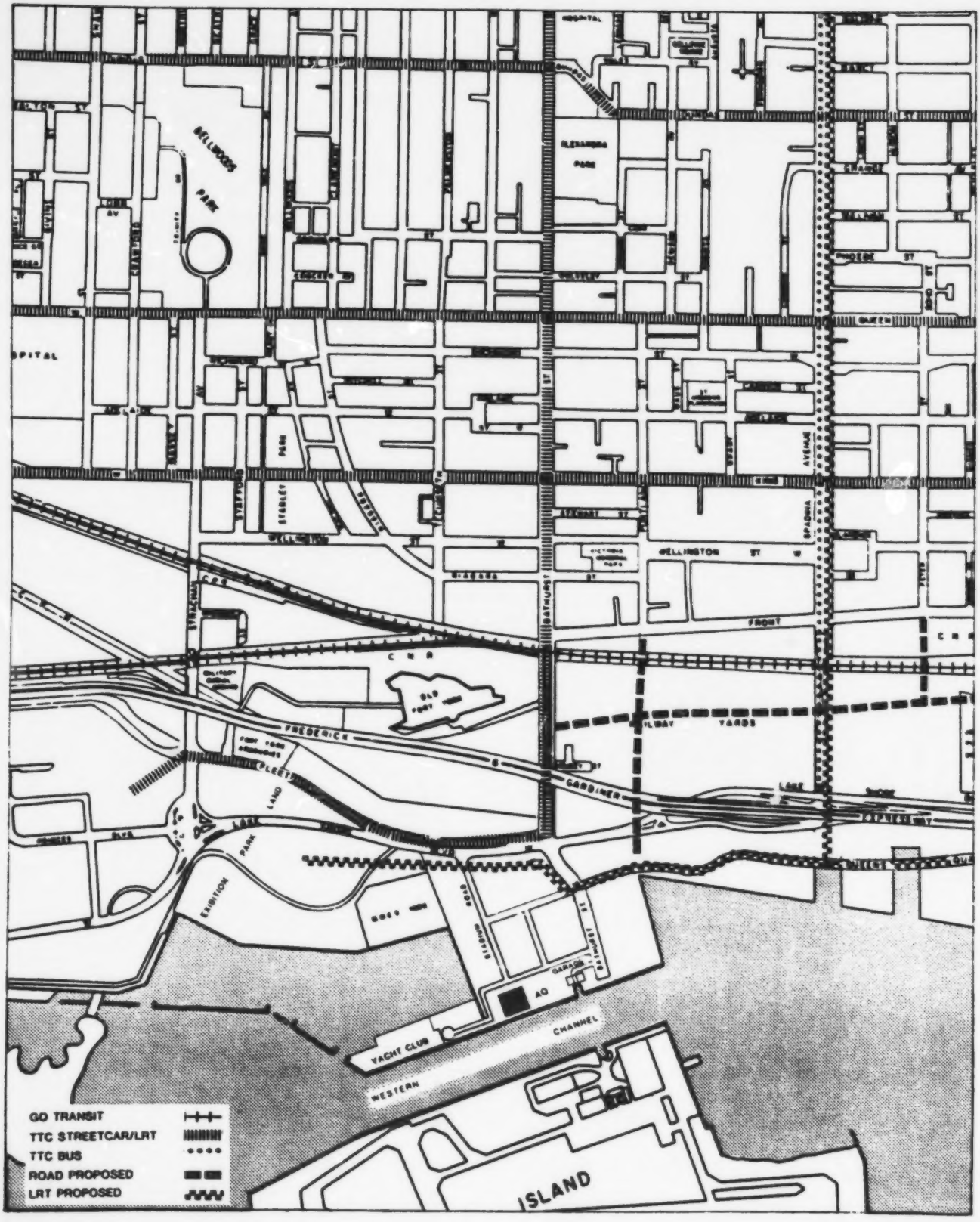
Stadium Road currently has an unorthodox signal - controlled intersection with Lakeshore Boulevard. In connection with the proposed redevelopment of the Toronto Harbour Commissioners' Stadium Road properties, an intersection improvement which would provide an exclusive westbound-to-southbound left turn lane at Lakeshore/ Stadium has been proposed.

The recommended improvement notwithstanding, the "pure" northbound-to-westbound left turn demand forecast at Lakeshore/Stadium cannot be accommodated at this intersection for a variety of operational reasons. Consequently, all vehicle trips destined to the west from Bathurst Quay, from properties along Stadium Road, and from the parking facility serving the Island Airport, will have to use Bathurst Street. The Aquarium would have an opportunity to connect with Bathurst St. and the new parking garage by extending easterly the new South Road as shown on the location plan.

Other road improvements proposed by Metropolitan Toronto and the City of Toronto for the waterfront area in general and the Gardiner Expressway/Lakeshore Boulevard corridor in particular, (i.e. Front St. Extension, Gardiner ramps rationalization, etc.) would enhance traffic operation both on Lakeshore Boulevard and at the Lakeshore/Bathurst intersection. However, the timing of these improvements remains uncertain. Each would entail significant financial outlay and "political" difficulties, and in any event cannot be considered realistically attainable before 1990.

PARKING:

Using the figures in this report, prepared by Economics Research Associates, the Aquarium will generate a peak parking accumulation of between 324 and 389 vehicles, based upon a 12-hour daily operation.



STADIUM ROAD SITE

TRANSPORTATION OPTIONS

Allowing for a five-to-ten percent stall vacancy factor which is a typical allowance for the vacancies resulting from the "search pattern" in a "transient" parking facility, it is suggested that a parking supply range of 350 to 425 should be adopted for preliminary planning purposes. The question which remains, relates to how much of this supply should be provided on or immediately adjacent to the aquarium site as stalls dedicated exclusively to the Aquarium. This is difficult question to answer, in that the answer must depend so heavily upon the nature and parking demand generation potential of land uses adjacent to the aquarium. Because of the limited opportunity to "share" parking with residential development, the crucially significant level of "sharing" will depend almost entirely upon the nature of development (and parking supply) on the Toronto Harbour Commissioners' Stadium Road holdings, and the usage pattern of the aforementioned STOL (Island Airport) garage.

Assuming that some "off-site" (but nearby) parking will be available during peak aquarium attendance times, it is recommended that an additional 250 parking stalls be provided for exclusive dedication to the aquarium. It is suggested that an arrangement could be worked out whereby these spaces could be added to the stalls planned for the Island Airport Garage. Although complex, this solution would be the only economically feasible method of providing the necessary parking component.

PUBLIC
TRANSPORTATION:

The site would be primarily served by public transit in the form of the Bathurst streetcar, an already heavily used service which follows Bathurst and Fleet Streets.

The proposed Bay-Queens Quay light rail transit (LRT) project, whose first phase will extend from an underground transfer station at Union Station to a terminal loop at Queens Quay (realigned) and Spadina Avenue (extended) is likely to be in operation by 1988 or 1989. The proposal is now under active consideration by Metropolitan Toronto, and has already been approved in principle by the Toronto Transit Commission.

General proposals have been made to re-establish LRT (streetcar) service on Spadina Avenue between the Bloor-Danforth subway and Queens Quay, and to extend the Queens Quay LRT westward to Bathurst Quay, and possibly to Ontario Place.

Perhaps, needless to say, this major enlargement of the T.T.C. streetcar/LRT system would significantly enhance the accessibility of the central waterfront in general, and the Stadium Road Aquarium site in particular. However, the two extensions just mentioned are currently in the form of preliminary proposals, and in any event are hardly likely to be implemented until the mid-1990's. This view notwithstanding, if the proposed new stadium were to be located at either Exhibition Place or Coronation Park, the Queens Quay LRT extension may well be afforded a higher priority.

Other transit system extensions and improvements (eg., "Downtown Relief Line" intermediate capacity transit system -- ICTS; ICTS "shuttle" from Union Station to Exhibition Place), would also enchance the accessibility of the site in question, but if anything, are even further away from being implemented than are the LRT proposals discussed above.

AVAILABILITY/COST:

It is envisaged that the Aquarium site would be located partially on land owned by THC and partially on land owned by the Harbourfront Corporation.

Given the mandate of these two government bodies it is possible that the land could be made available to the Aquarium. The difficulty centers around the fact that both the sites have already been designated for some very definite developments. It would require some major adjustments to the densities, configurations and designs in order for the Aquarium to be introduced into this area.

On the pro-side, no construction has as yet taken place and should the planning of the developments undergo major changes, this site could become highly viable as an Aquarium location.

The two landowners are aware of the proposals contained in this report however, they are unable to comment at this time.

ZONING:

The westerly portion of the site, owned by the Harbour Commissioners was originally zoned C3V3. This designation is presently under review and in The Central Waterfront Final Recommendations prepared by the City of Toronto Planning and Development Department March 1984, it calls for zoning CRL 0.5 U100 with a provision that through rezoning a full density of 3 times the area of the lot would be available for a mixed use development.

The easterly portion forms part of Harbourfront lands and therefore falls under Harbourfront Zoning By-law No. 596-80, as amended. It is Area "F", Combined Area 5 and has maximum development potential of 99,038 square metres. The Aquarium would constitute a permitted use.

Over and above the existence of approved Official Plan and Zoning By-Law documents, an existing sub-area plan detailing the nature of development on a parcel-by-parcel basis for Bathurst Quay has been approved by City Council for those areas west of the existing Bathurst Street. This sub-area plan contains the approval for 500 units of non-profit and co-op housing in low to mid-rise structures. In addition to the adjustments to the Zoning By-Law and Official Plan, an amendment to the existing sub-area plan to permit the Aquarium adjacent to Stadium Road would be required.

Because of the extent of work completed to date on the development of assisted housing, particularly the co-operative housing projects, there will be difficulty in dramatically altering the nature of development adjacent to Stadium Road. Further, resistance could occur at the suggestion of changing what has already been approved as the prime family-oriented and assisted housing neighbourhood at Harbourfront.

WATER:

The site as proposed would be immediately adjacent to the Lake.

VISIBILITY:

Located at the bottom of Stadium Road, the Aquarium would not be visible from the main arteries of Gardiner Expressway and Lakeshore Boulevard. Good views of it would exist from the water particularly from the west, whereas the view from the east would be partially obscured by the mass of Canada Malting silos located at the woutheast corner of the Quay.

IDENTITY:

This site would provide the Aquarium with good opportunity to become an independent landmark. Additionally, the site's proximity to Ontario Place, Coronation Park and the CNE is an added advantage in that they all reinforce each other's presence and help maintain the City's long standing tradition of using this part of the waterfront for recreational purposes.

3.2.3 MAPLE LEAF QUAY EAST/RECOMMENDED SITE

AREA:

The size of the total quay is about 15,600 m². As there are additional uses to be accommodated on this site, the Aquarium will have sufficient land only if the total design allows for sharing of some approach roads and landscaped outdoor space amongst all the users of the site. Similarly, expansion will have to be carefully planned at the outset in order to ensure that the land remains available for the necessary length of time.

LOCATION:

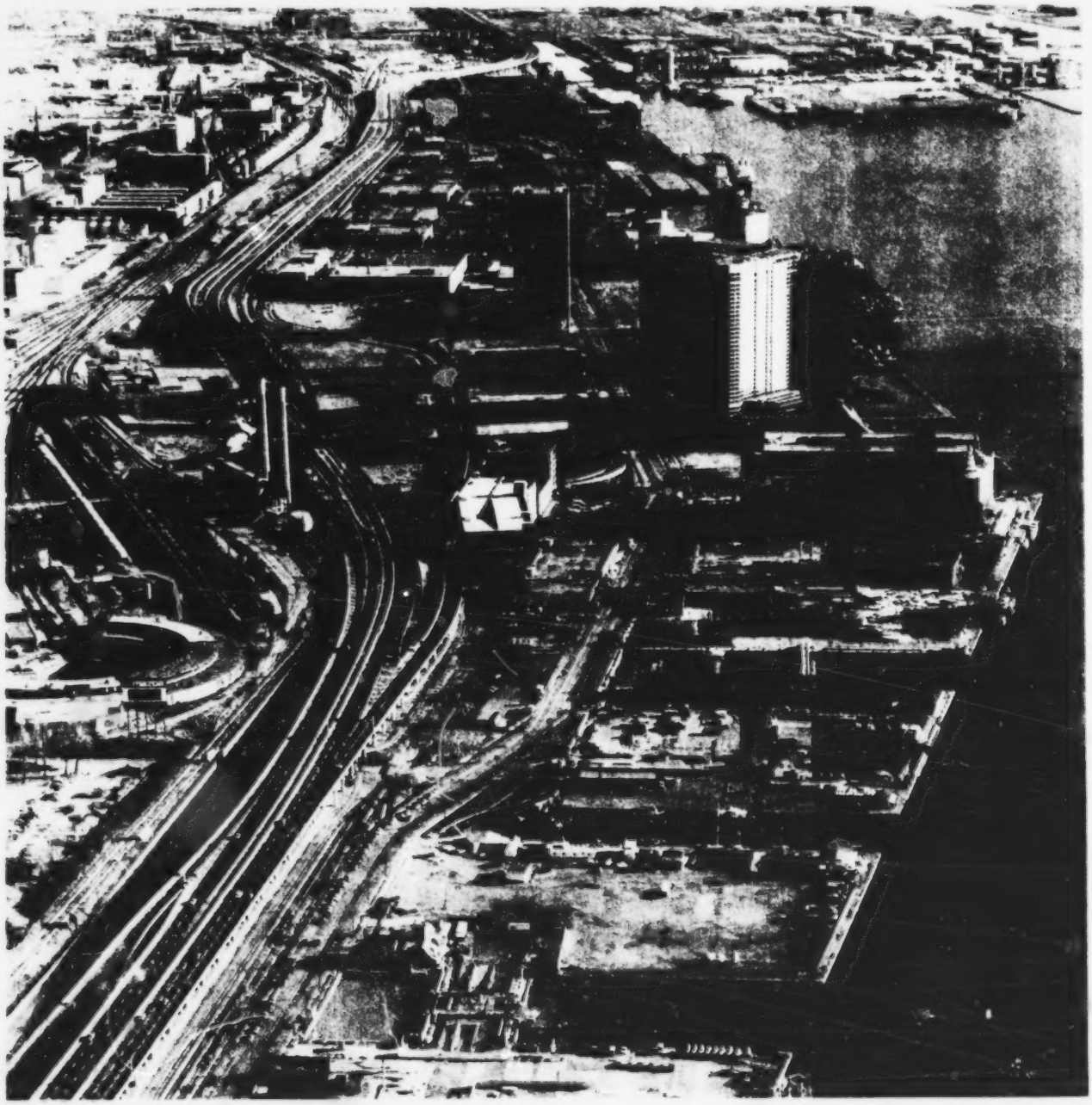
Maple Leaf Quay is located in the heart of Harbourfront. As this is currently the center of established waterfront activity, this location is ideal with respect to Aquarium's ability to draw maximum numbers of visitors.

CONTEXT:

Following its mandate, Harbourfront has been creating spaces which support numbers of recreational, commercial, educational and other similarly oriented activities. Beyond those areas already existing in Queens Quay Terminal, Arts Complex, York Quay Centre and Pier 4, several new developments such as Hotel Admiral and Harbourfront Condominiums are in various stages of planning and construction. Together, these will form an ideal opportunity for the Aquarium to develop a strong symbiotic relationship with its context.

On the Quay itself it is anticipated that a park, possibly a sailing school, retail and some residential occupancies will take place. Although a residential use is not normally considered an ideal neighbour to an Aquarium, examples in other cities have shown that as long as the residential is high rise and does not occupy the ground level, the two experience no conflict.

A quick glance at the map showing Harbourfront's layout indicates that at present the east end is mostly commercial, the west end mostly residential. This site appears almost exactly in the middle. The Aquarium's location on this site would be a strong linking mechanism which would act to reinforce the continuity of all of Harbourfront.



MAPLE LEAF QUAY EAST SITE

MAPLE LEAF QUAY EAST SITE

ROADS:

Queens Quay is being realigned as a major four-lane road, and will provide direct access to the site. Provision is made in the Harbourfront plan for one major road access point. Depending upon the site layout, an additional access point providing right turns in/out only, may be possible.

Other major road improvements proposed by Metropolitan Toronto and the City of Toronto during the past two years include:

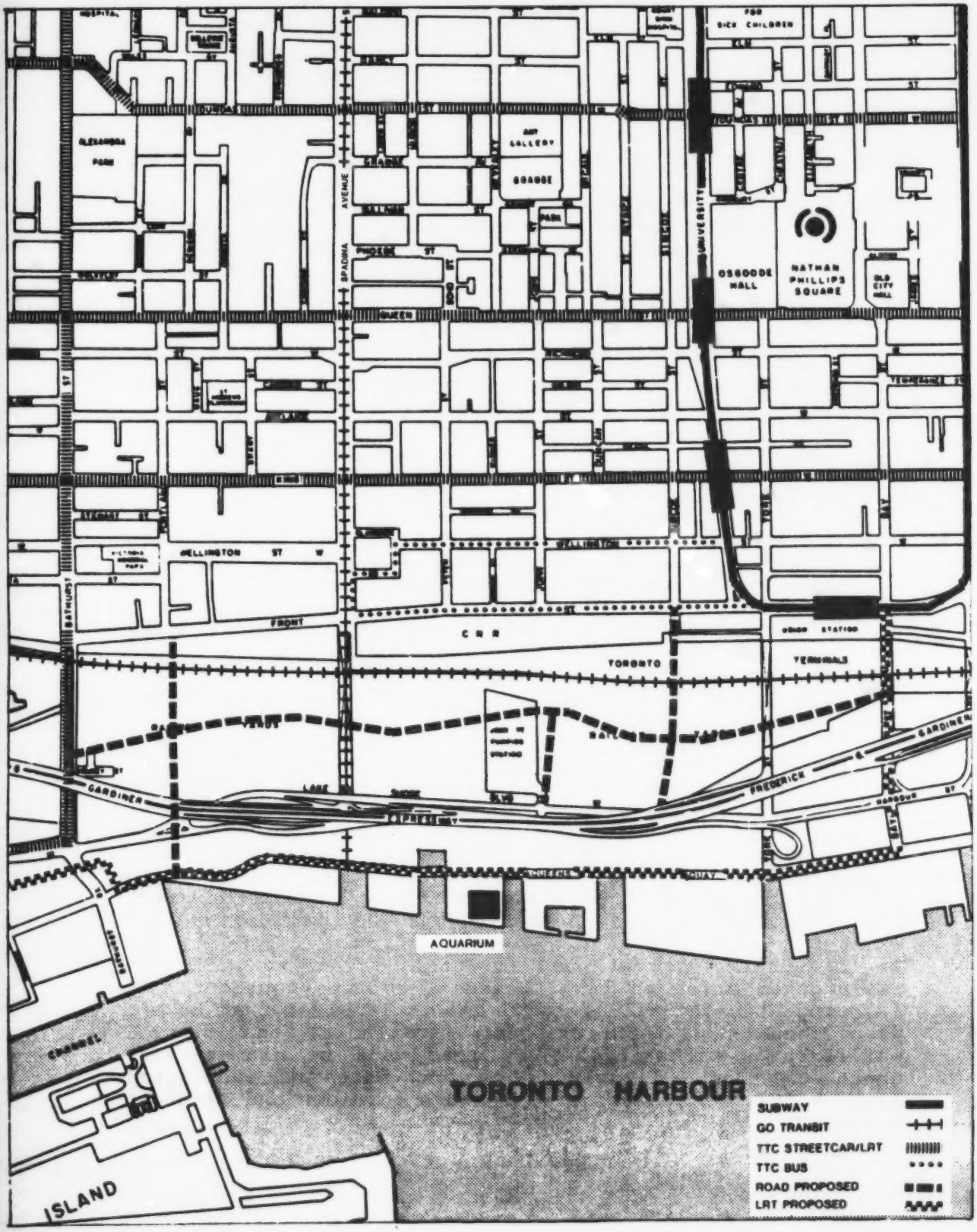
- The westward extension of Front Street to Strachan Avenue and Exhibition Place, with a link to the Gardiner Expressway;

- The southward extension of Simcoe Street from Station Street to new interchange facilities on the Gardiner Expressway (and possibly to Queens Quay);

- Major modification of the interchange system linking the Gardiner Expressway, Lakeshore Boulevard and certain major north-south streets, aimed at ameliorating serious weaving and other operational problems; and

- Other road elements included in the Railway Lands Secondary Plan (Portland Street extension from Front Street to Lakeshore Boulevard and Queens Quay, widening of Spadina Avenue and replacement of viaduct, Peter Street extension to Esplanade, Esplanade between Bay and Bathurst Streets forming the "spine" of the Railway Lands, and the improvement of John-Rees Streets from Queens Quay to Esplanade).

It is unlikely that any of the foregoing will be implemented prior to 1990. However, serious consideration is being afforded all of them, and it is clear that as and when these new facilities are available, the central waterfront's accessibility by road will be dramatically enhanced, thanks largely to the provision of additional links between the Gardiner-Lakeshore corridor and downtown Toronto.



MAPLE LEAF QUAY EAST SITE TRANSPORTATION OPTIONS

PARKING:

The whole matter of "recreational parking" at Harbourfront is the subject of ongoing study. According to Harbourfront officials, "flexibility" in terms of reallocation of parking supply in lock-step with land use commitments is the rule. The January 1984 "Parking Supply Scenario" prepared by Kleinfeldt/Mychajlowycz and used as source material is already out of date in relation to specific sub areas. Using the figures in this report, prepared by Economic Research Associates, a peak parking accumulation of between 324 and 389 vehicles will be generated, based upon a 12-hour daily operation. Allowing for a five-to-ten percent stall vacancy factor which is a typical allowance for the stall vacancies resulting from the "search pattern" in a "transient" parking facility, it is suggested that a parking supply range of 350 to 425 should be adopted for preliminary planning purposes. The question which remains relates to how much of this supply should be provided on or immediately adjacent to the aquarium site as stalls dedicated exclusively to the aquarium. This is a difficult question to answer, in that the answer must depend so heavily upon the nature and parking demand generation potential of land uses adjacent to the Aquarium site.

Considering the broad array of commercial, residential and recreational land use elements which will be in place when Harbourfront is fully "built out" in accordance with current plans, and in view of the fact that most of the parking stalls designated for office employees will not be occupied by these primary users on days of peak aquarium attendance (e.g. weekends, holidays, summer weekday evenings), we recommend that no more than 250 parking stalls be provided exclusively for Aquarium uses (employees and visitors combined). With specific reference to the Maple Leaf Quay East site, it is significant to note that Harbourfront currently foresees the development potential for between 180-270 parking stalls (largely office related) in the form of a 2-3 level parking structure on the north side of Queens Quay West, immediately opposite Maple Leaf Quay East.

PUBLIC TRANSPORTATION:

Metro is currently reviewing the proposal for the Queens Quay light rail transit (LRT) service which would operate along Bay Street and Queens Quay. The initial phase of this project is to extend from an underground terminal at Union Station providing convenient transfer with GO Transit and subway services, to a terminal loop at Queens Quay (realigned) and Spadina Avenue (extended). Later extension would reach Bathurst Quay, and possibly, Ontario Place. Should this project receive Metro approval in 1985, it will be in operation by 1988 or 1989.

It is proposed that LRT (streetcar) service will be re-established on Spadina Avenue between Queens Quay and the Bloor-Danforth subway SPADINA station. It is unlikely, however, that this line will be in operation prior to 1990. With the completion of such a line, however, the accessibility by public transit of all of Harbourfront -- including the Aquarium -- will be greatly enhanced, and the ability to route LRT vehicles to Harbourfront from all points on the rail system will be at hand.

Other major public transit planning initiatives are all in their early planning stages. These include:

- The "Downtown Relief Line", an intermediate capacity transit system (ICTS) extending in its first phase from PAPE or GREENWOOD station on the Bloor-Danforth subway through Union Station to Spadina Avenue in the Railway Lands;

- The GO-ALRT electrified replacement for the GO Transit Lakeshore services;

An ICTS shuttle link (or extension of the DRT) between Union Station and Exhibition Place is still being considered, but appears unlikely to receive the go-ahead.

It is virtually certain that none of these will be implemented and in operation before the end of the century. However, Railway Lands development staging, and the (hopefully imminent) decision relating to the location of a new stadium may fundamentally affect the schedule of these and similar initiatives.

ZONING:

The existing zoning on the site is part of Harbourfront Zoning By-law No. 569-80, as amended. The site itself is Area "D", Combined Area 3 with a maximum development potential of 91,578 square meters.

Although the Aquarium would be a permitted use, adjustments to the Harbourfront Zoning By-law and a minor modification to the Harbourfront Official Plan would be necessary. These changes would be to secure the floor space area required to that residential and non-residential floor space already permitted and planned for development by Harbourfront Corporation. It is anticipated that this would be a simple process in view of the nature of the proposal and its compatibility as a major institutional/cultural use.

AVAILABILITY/COST:

Maple Leaf Quay is owned by the Harbourfront Corporation. The Corporation's mandate as reaffirmed by the Federal Government in June 1980 is to: "....permit Harbourfront to develop the site to its full potential as Toronto's central, urban waterfront promoting Harbourfront as a public place and developing its unique waterfront potential to the full." Given this type of mandate it is easy to understand how the Aquarium is perceived as an ideal facility to be included as part of Harbourfront.

Several discussions have taken place with Harbourfront regarding this proposal. Its representatives feel that with appropriate arrangements land could be made available at no cost to the Toronto Aquarium.

WATER:

This site is surrounded by water on all three sides and is ideal for siting the Aquarium immediately adjacent to water.

VISIBILITY:

The site's position, in the middle of Harbourfront and virtually in the centre of Toronto's waterfront, gives it excellent prominence on Toronto's skyline.

By locating the Aquarium at the south-east corner of the Quay (see enclosed sketch) some blocking of views will occur. From Queens Quay both eastward and westward the adjacent developments will somewhat block the view. However, since the developments will be relatively low-rise, the views from the elevated Gardiner Expressway will be good.

Views from the water, will be excellent from virtually every direction .

IDENTITY:

Since the Aquarium would be located in the midst of Harbourfront it can be anticipated that a certain amount of blend of identities could take place. But by examining parallel situations in other cities, it would appear that a more likely scenario is one where the Aquarium becomes such a strong draw that is a very short time it becomes a powerful magnet and establishes its own independent identity.

3.2.4 MARINE TERMINAL 27/RECOMMENDED SITE

AREA:

This site at ± 43,000 m² is virtually the largest site under consideration. Although a commercial/residential development is contemplated for the site, with the right type of design the Aquarium could comfortably be granted a large piece of land both to accommodate the initial building and to allow for expansion.

LOCATION:

MT 27 is located at the southeast corner of the intersection of Yonge St. and Queens Quay Blvd. East. At the present, the waterfront east of Yonge has not developed its potential for supporting commercial/recreational activities. In that sense the site is not in the midst of the established activity centre. A lack of pedestrian connections along water's edge, which presently stops in the area of the Harbour Castle lands tends to isolate the site.

On the other hand, the Aquarium's presence on MT27 would very shortly begin to change this westward polarity. Combined with the alterations proposed for the southern end of Yonge St. this site located at the apex of Toronto's traditional spine, would soon establish a recognized prominence. The result could very well be a more balanced development scenario for Toronto's waterfront.

CONTEXT:

MT27 is surrounded by a hotel cum residential development, an office building and a highly industrial complex. Future plans for the site may contain retail, commercial, another hotel and upper level residential components. All of these are seen as essentially compatible uses juxtaposed with the Aquarium.

The site's industrial neighbours, all located to the east, and including Redpath Sugar, Victory Soya Mills, and Canada Malting, when consulted felt that with the right type of design, the Aquarium would be an acceptable neighbour.

MARINE TERMINAL 27 SITE

MARINE TERMINAL 27 SITE

The site at present lacks adeuqate supporting commercial retail development although these appear in a minimal form at the adjacent Harbour Castle Hilton. The opportunity does exist for the development of the remainder of the site into commercial/retail spaces, where the Aquarium would again find itself within an appropriately supportive urban context. It is also quite likely that the idea of the Aquarium and the development would become interdependent, the presence of one spurring on the feasibility of the other.

The presence of the Ferry docks, half a block away would also provide exceptionally strong support to the Aquarium's presence in this location. Long before Toronto received its recent impetus to re-develop its waterfront, the ferries were the one location where citizens flocked to, to get their glimpse of sun and water by travelling to the islands. Thus, the ferry docks have become imbedded in everyone's mind as the access point to the Lake. This symbolic association of uses, plus the presence of large crowds of people within a two minute walk from the Aquarium would give a strong boost to the Aquarium's attendance figures.

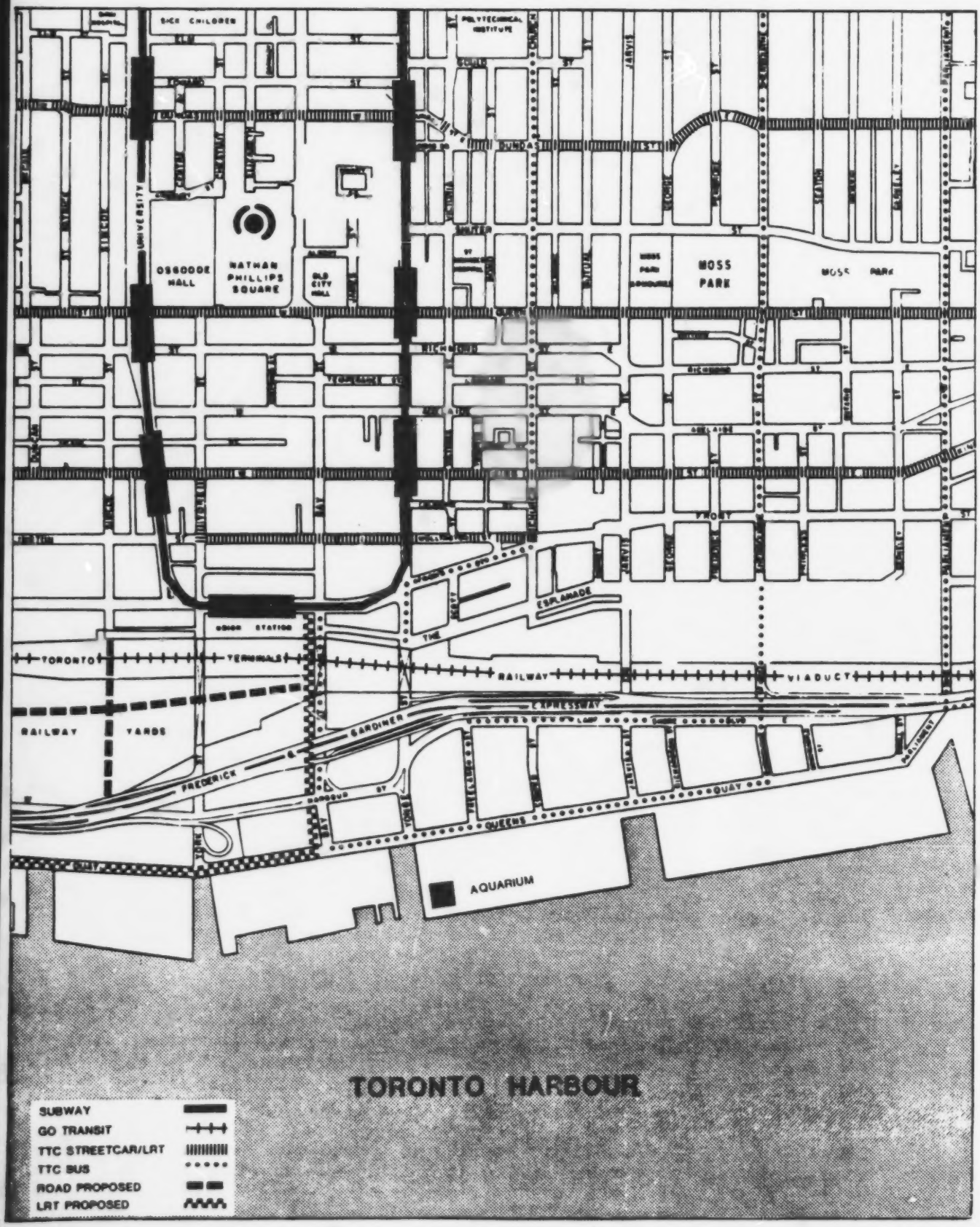
ROADS:

During the summer months this site is accessible by pedestrians who can walk from the Union Station subway stop. This is a route already favoured by Ferry boat users and with proposed improvements to the railway underpass will become the major pedestrian access point to the whole inner harbour.

Queens Quay will continue to operate as a major boulevard past the site. A minimum of four lanes, with provision for exclusive left turn lanes, will be available following the removal of the existing railroad track.

The "rationalization" of Yonge Street as a two-way four-lane through street between Queens Quay and Lakeshore Boulevard is under study in connection with Gardiner-Lakeshore ramp modification studies referred to in the Maple Leaf Quay East site discussion.

Consequently, this site would be afforded excellent accessibility by road; i.e., directly from the three



MARINE TERMINAL 27 SITE

TRANSPORTATION OPTIONS

cardinal directions -- north, east, and west; whereas the Maple Leaf Quay East site would have to depend upon Queens Quay alone for all auto and service access.

Comments made in relation to certain longer-term road improvement proposals extant in the Maple Leaf Quay East discussion are also relevant to the Marine Terminal 27 site.

PARKING:

In connection with parking requirements, if a major mixed use development is proceeded with in conjunction with the aquarium, as is proposed herein, the number of parking stalls which should be "dedicated" to the aquarium per se, as recommended in the Maple Leaf Quay East site discussion; i.e., 250; would remain valid for the Marine Terminal 27 site. In the event that the site will be occupied by the Aquarium alone (or initially), it may be prudent to provide more than 250 stalls, if only because parking availability on adjacent and nearby sites is fairly limited. This limitation would be exacerbated as and when the Toronto Harbour Commissioners' "World Trade Centre" project is implemented. Such a parking stall surcharge is not seen as a major deterrent, however, in that sufficient space will undoubtedly exist on this very large site to provide parking stalls in a temporary surface lot. This lot would presumably be eliminated as and when additional development occurs on the site, which in turn will incorporate additional (structure) parking.

PUBLIC TRANSPORTATION:

The closest approach to the Marine Terminal 27 site of the proposed Bay-Queens Quay LRT service referred to in the Maple Leaf Quay East discussion will be at the intersection of Bay Street and Queens Quay, some 240 m away. However, this separation would not be a disbenefit if the quality of the pedestrian connection is maintained at a high level by taking advantage of such measures as well landscaped, appropriately sheltered walkways.

At present, the Bay trolley bus service follows Queens Quay and serves the site directly. Whereas the operation of this service may well be modified following inauguration of the Bay-Queens Quay LRT service, it may be

confidently assumed that the level of public transit service on Queens Quay east of Yonge Street will not be reduced. Indeed, the likelihood is that service will be improved.

Comments made in relation to certain longer-term public transit system improvement proposals extant in the Maple Leaf Quay East discussion are also relevant to the Marine Terminal 27 site.

ZONING:

The original zoning for this site was C3V3, but this was rezoned under holding By-law 35-76 to C2V4. Although approved by Council the new zoning has never been by the Ontario Municipal Board. A new zoning is currently under study. In Part 1, (Central Waterfront) of the official Plan, the site is discussed in general terms with the intent of the new designation described verbally. Part II of the Official Plan should contain the new zoning designation.

It is possible that if the Aquarium were to proceed on this site, its presence could be written in at the planning stage.

AVAILABILITY/COST:

The major portion of the site belongs to the Harbour Commissioners (THC) with a small key portion at the north-west corner belonging to Torstar Ltd.

Both landowners are aware of this proposal and discussions have taken place with both.

This study makes a proposal which includes some preliminary suggestions on how the remainder of the site could be developed in a way in which both the development and the Aquarium could benefit maximally from each other. In this exercise it was assumed that the site's overall density would not be diminished by the Aquarium's presence but would include additional density above and beyond what is currently contemplated for the site. In this manner, the landowners would suffer minimal loss from the severance of land dedicated to the Aquarium.

It is also understandable that the landowners consider this land to have high commercial value and wish to achieve maximum return from it. For this reason they are unable to comment on this study until a specific development proposal is presented to them.

WATER:

This site is bordered on the north and south sides by water and would therefore provide ample opportunity for the Aquarium to be located right on the water's edge.

VISIBILITY:

MT27 is considered a prominent waterfront location. Given the large expanse of the site and its prominence the Aquarium would occupy a significant position both visually and psychologically. From anywhere on the water the views would be excellent. From land, views southward and westward would also be good, while the view eastward would be significantly blocked by the Harbour Castle development. On balance, however, this would still be a highly satisfactory setting for the Aquarium.

IDENTITY:

This site is presently known as MT27 and has no existing historical association which would overshadow the Aquarium. It can also be expected that the future commercial development would be more likely to complement the identity of the Aquarium than to overwhelm it thus the Aquarium would have no impediment to becoming a strong entity.

3.3 Schematic Layout

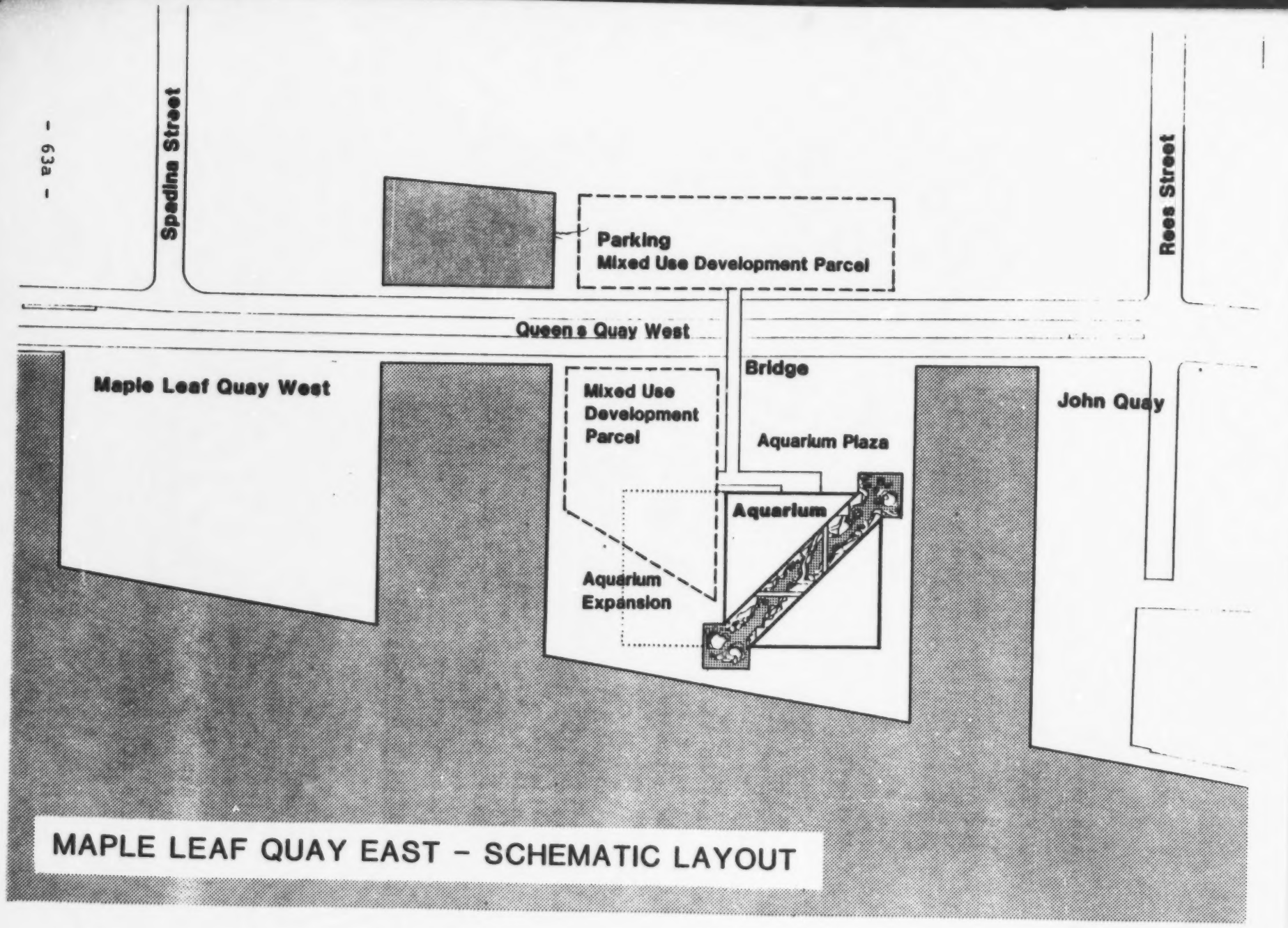
Urban Interaction/Mixed Use

The potential for long term financial success of a Toronto Aquarium can be expected to be considerably improved if the institution does not stand alone in its urban setting, separated by long distances from other activity. As will be described in detail below, two of the four alternative sites offer possibilities of close interaction, even partial integration, with a specialty shopping complex, including substantial numbers of waterfront-oriented restaurants and shops, and with weather-protected connections to the Aquarium, and shared parking. Aquarium attendance and revenues can be expected to increase substantially if visitors are offered many choices of waterfront activity, such as places to stroll, shop, and have lunch, before or after a visit to the aquarium, or further options such as dinner and entertainment, after a visit to the aquarium, without the necessity of driving or finding transportation to a new location.

In Boston, the New England Aquarium is within walking distance of the Faneuil Hall Marketplace, but with enough distance to be discouraging in cold or wet weather. In Baltimore, the National Aquarium is within sight and similar walking distance of Harbor Place, and in a milder climate zone. For Toronto, a more direct adjacency to shops, cafes and restaurants is proposed, and with much shorter distances between weather-protected and fully-enclosed waterfront elements all along the Harbour.

Building Diagrams/Alternative Sites

The following notes and diagrams are an illustrative indication of possibilities at the indicated site, and are not intended to suggest a specific building design, which is not within the scope of this study. The diagrams indicate recommended possibilities of mixed use, which the authors of this study believe will be attractive to developers and offer numerous financial advantages to the Aquarium. Alternatively, if it becomes necessary for the Aquarium to be developed and designed as an independent entity, the same locations as shown on the diagrams would remain for two sites recommended by this study.



MAPLE LEAF QUAY EAST - SCHEMATIC LAYOUT

Maple Leaf Quay East

A diagrammatic plan has been prepared showing a possible illustrative use of this site. It suggests an Aquarium building and foreground plaza occupying approximately 5/8 of the Quay, which is at the approximate center of Harbourfront, and at the western end of Harbourfront's established commercial and entertainment area. The illustrative plan assumes that the Aquarium, together with retail and restaurant elements, would become a western anchor within Harbourfront. Although Harbourfront plans call for continuous public and retail uses at grade all along the water's edge, residential and more passive uses will become dominant west of this quay.

Pedestrian movement from the eastern end of Harbourfront, at the Hilton Harbour Castle property and Queen's Quay Terminal, is proposed to be a continuous necklace along the water's edge, moving in and out as slips, quays, and their various developments will allow. Pedestrians moving along the water's edge from the East could pass by the Aquarium and continue around the Quay to its southwest corner, where they would arrive at a proposed outer plaza, with views across the water to the south and west.

A mixed-use development, with two levels of shops and restaurants, is proposed at the west side of the Quay, overlooking and activating this plaza. The pedestrian could continue northward along the water-oriented frontage at the western edge of the Quay, returning to Queen's Quay Boulevard, and could then continue westward, following the water's edge. Upper levels of the Aquarium, and particularly a restaurant/cafe, could also overlook the outer plaza, and the harbour beyond.

Visitors to the Aquarium arriving by car, bus and other vehicles could come to a drop-off and pick-up area directly adjacent to the Aquarium. Construction of a parking garage is recommended directly north, across Queens Quay Boulevard, allowing Aquarium visitors to park within reasonable walking distance, and to arrive at the Aquarium either at grade, with a signalled crossing, or preferably by a directly connected footbridge from the third level of the garage, which could correspond in

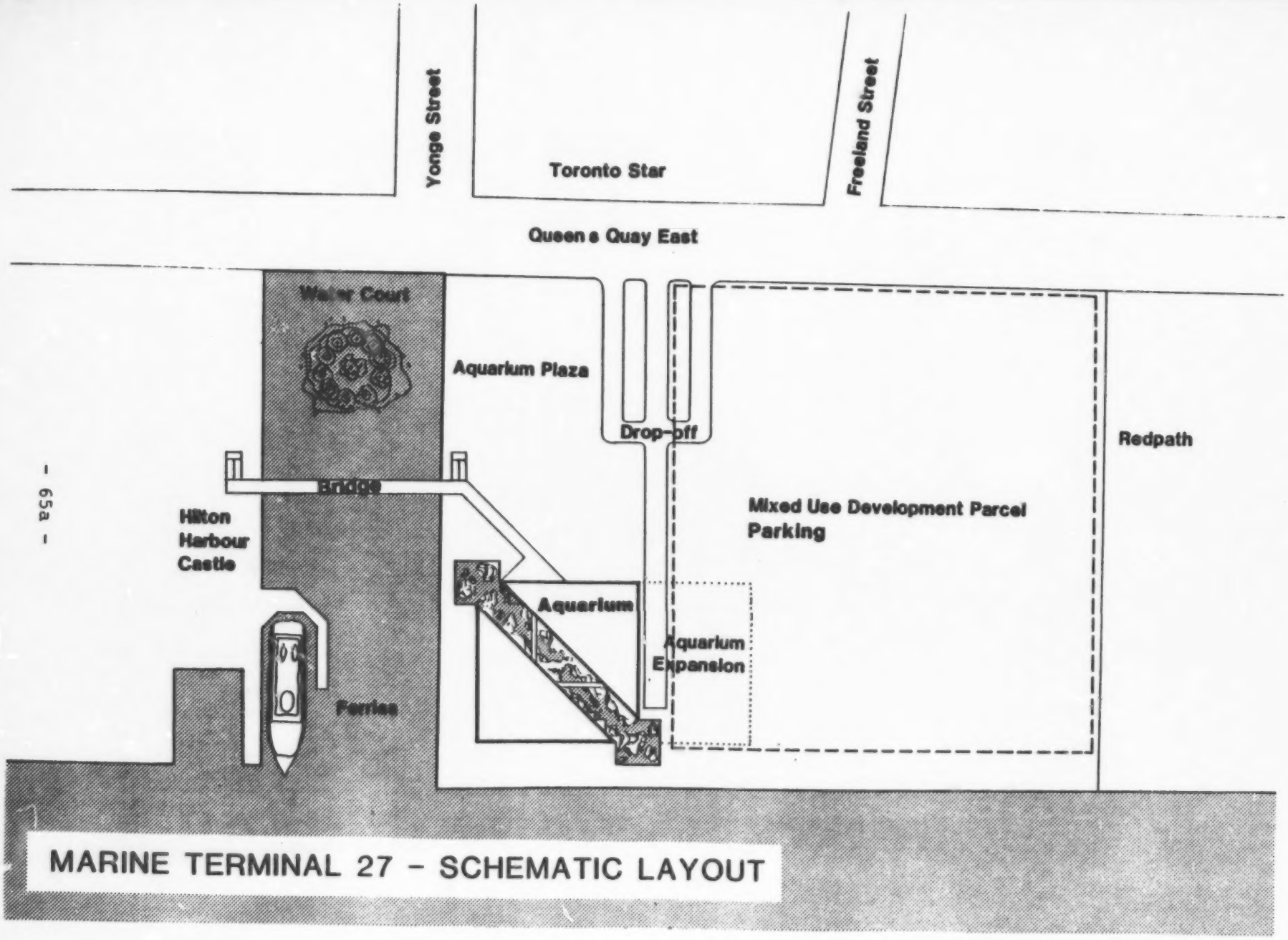
elevation to a second level aquarium entrance lobby. This same second-level access from the garage would lead directly into the second level of retail, thereby providing pedestrian traffic to that upper level of retail. Low-rise housing units could occur on several levels above the retail.

Pedestrians entering the Aquarium at grade would rise by escalator from the plaza to the raised lobby entrance. At the base of the Aquarium, a narrow strip of shops and restaurants would follow the water's edge so as to provide fully animated harbour frontage. Internally, at grade level, the Aquarium is proposed exclusively for staff functions, with all interior public space beginning at the second level.

Delivery docks, trash removal and other servicing would occur at grade at the northwest corner of the building, separated from all public areas. The service access would be shared with the proposed retail complex.

At the northeast corner of the building, a feature element is suggested in the illustrative plan, an outdoor exhibit of Steller's sea lions, seen from all directions as visitors approach the building. This exhibit is conceived, as described earlier, as the beginning of an exhibit "fjord," a slice of outdoor exhibits contained between two primary building forms. The two architectonic forms would make a strong contrast with the enclosed natural forms of rockwork and cascading water. The fjord would step up through the building to higher levels, allowing these active climbing animals to be seen at many levels from the outside, and later on, at several levels from the inside. This slice of space would also be seen to continue between the building forms, reaching diagonally toward the Harbour on the southwest corner. Here, once again, the public outside the building would see a live exhibit, with its natural forms cascading down to grade, this time at the Harbour's edge.

To the north side of Queens Quay Boulevard, the proposed garage could be screened by retail frontage, on two levels, and possibly with offices above to more fully screen the garage and to take advantage of the site's opportunity. At the western and eastern ends of this same site, high-rise housing might rise above the garage and above the expressway.


Yonge Street
Toronto Star
Freeland Street
Queen s Quay East
Water Court
Aquarium Plaza
Drop-off
Redpath
Bridge
Hilton
Harbour
Castle
Mixed Use Development Parcel
Parking
Aquarium
Aquarium
Expansion
Ferries
MARINE TERMINAL 27 - SCHEMATIC LAYOUT

The garage, with one or two pedestrian bridges, would be shared by the housing, the retail, a small number of office tenants, and the Aquarium.

As noted above, the diagram presumes a second level concourse, directly connecting the Aquarium's lobby with the second level of retail shops south of Queens Quay Boulevard, and to the garage and more retail shops at that same level directly across the Boulevard. If a pedestrian bridge could not be built, connections would have to occur at grade.

Through the combination of aquarium and retail, as proposed here, a major attraction will have been created, offering Harbourfront a strong anchor, active day and night, animating the water's edge and drawing people to the site year-round.

M.T. 27/East of Yonge Street

The diagrammatic illustrative plan for this larger site suggests an Aquarium building occupying approximately 1/5 of the available land, at its southwest corner, so that this very public building would have full visibility from Yonge Street, and from Queens Quay Boulevard and Harbourfront to the West. In this location, together with any other public uses sharing the site, the aquarium would become an eastern anchor to the harbour's public development.

The west-to-east pedestrian path from Harbourfront along the water's edge, would need to pass by the existing condominiums and hotel, behind the Ferry docks, and possibly cross the slip at a midpoint, as shown in the diagram. The path could then continue around the Aquarium's two water oriented edges, and continue eastward along the water until terminating at the Redpath Sugar Refinery.

Pedestrians and drivers arriving at Queens Quay Boulevard would approach the Aquarium via a foreground plaza, at the edge of the slip, where Toronto's Harbour dramatically comes to the foot of Yonge Street. The northernmost end of the slip becomes, in effect, a water court to the side of the Aquarium's plaza, suggesting possibilities for dramatic signalling of this important

point of connection betweeen City and Lake, where ferries also carry passengers out to the Toronto Islands.
The diagram suggests ways in which this site could be developed with mixed use, and with vehicular access and parking, all on the south side of Queen's Quay Boulevard. A major advantage of this site is its potential to provide parking as a buffer between public uses and the Redpath refinery, along the Boulevard at the northeast corner, and substantial frontage and depth for retail, and other public use, along the water's edge.

We recommend consideration of a major hotel and retail complex, with substantial multi-level parking, sharing this site with the Aquarium, and all being interconnected, and effectively integrated, at many levels internally, and at the water's edge. Vehicular drop-off to the Aquarium and hotel/retail can occur in a shared zone off Queen's Quay Boulevard. Servicing areas at grade can be similarly shared. A concourse leading from the garage to the Aquarium's lobby, at a raised second level, can cut through the lower levels of the hotel, and bring people directly to the retail complex. Several connections between grade along the water and upper levels of retail are possible, all connecting to the Aquarium and to the Hotel, and all oriented dramatically to the water's edge. Further possibilities of mutual reinforcement might include restaurants at the base of the hotel, or within the retail complex, enjoying an internal view into exhibit habitats of the Aquarium.

The possibilities of integrated planning suggest an attractive opportunity for a private developer, and in turn an important opportunity to achieve financial support for the Aquarium.

The diagrammatic and illustrative plan shows, for the purpose of this feasibility review, the same concept of a multileveled aquarium building divided in half by outdoor animal habitats, slicing diagonally, with their natural forms, through the architectonic forms of the building. Stellar's sea lions are proposed at the Plaza front, terraced on many levels and visible from all directions.

The diagram is based on the assumption of integrated mixed-use development. If the Aquarium were required to stand alone, the same location for the Aquarium building

is proposed. All components of the plan would remain workable, with the exception that parking for Aquarium visitors would have to be provided without conflict with other uses.

The proposed mixed-use development, in close combination with the Aquarium, could produce significant economic and environmental benefits to the Aquarium, to the developer, and to the owners of the land. It could provide a further benefit to the City of Toronto, initiating major public use of the waterfront to the east of Yonge Street.

4. Economic Analysis

4.1 North American Aquaria

ERA surveyed 3 Canadian and 5 United States aquaria to determine operating information, attendance, and market penetration. Operating information is presented in Tables 1 (Canadian Aquaria) and 2 (U.S. Aquaria). The three Canadian aquaria are the Vancouver Public Aquarium, Montreal Aquarium, and Quebec Aquarium (a provincial facility). The two Quebec facilities are smaller and have lower attendance, pricing structure, and budgets, although the resident market population is highest in Montreal. The United States aquaria are more diversified in attendance, with the Aquarium of Niagara Falls having the fewest visitors, at 147,840. Admission fees are higher in the United States ranging from U.S. $2.00 (adult) at the Shedd Aquarium, Chicago to U.S. $5.75 at the National Aquarium in Baltimore. The Canadian aquaria have parking for their facilities (Table 3) whereas in the United States parking is less likely to be included (Table 4). All aquaria are served by public transportation although when asked, personnel at the Canadian facilities felt their attendance would increase if public transportation were better.

Attendance and Market Penetration

Tables 5 and 6 examine annual attendance for the aquaria facilities from 1979 to 1983. When available, paid attendance was distinguished from total for the five year period. Total attendance includes annual member visitation, school groups, and other attendance which is free of charge. Generally, paid visitation is approximately 80 percent of total attendance, however some facilities have greater frequency of free visitors, such as the Shedd Aquarium in Chicago. Although all the aquaria are educationally oriented and some give free tours to school groups, the Shedd Facility has expanded its free tours to include social service groups as well as school groups. This has lowered its percentage of paid attendance. The Montreal and Quebec Aquaria offer no free tours; therefore, all figures are for paid attendance.

Attendance has dropped at most of the aquaria surveyed. In Montreal, paid attendance was cut in half when the dolphin show was discontinued in 1980. Attendance

generally increases with the addition of a major new exhibit (the Vancouver Aquarium added a gallery and sea otters were born in 1983) and special events (Shedd Aquarium celebrated its 50th Anniversary in 1980). In subsequent years attendance tends to decrease. This supports an important conclusion: annual attendance at an aquarium tends to stabilize and/or decrease without the addition of new exhibits or shows. An aquarium draws considerably from the local area, and many residents are reluctant to visit the aquarium unless there is something new to see. This is particularly true for the major aquaria, as they charge higher admission fees.

Tables 7 and 8 present monthly attendance distribution. All follow a seasonal pattern, with July and August as the peak attendance months, and the winter months of November through January as the lowest attendance months as demonstrated in Figures 1 and 2. These graphs show the average distribution of attendance for the Canadian and American facilities. Attendance is often bolstered by school groups in the spring months and the increased leisure time and tourists account for high summer visitation. This pattern also holds true for totally enclosed facilities, such as the National Aquarium in Baltimore.

Visitation is influenced by area resident population, average household income, tourism to the area, the general popularity of aquaria, and particularly the attraction content of each aquarium. For the purpose of this study, market penetration, presented in Tables 9 and 10, was determined by resident population and total visitation. The ratio was highest at the Vancouver Public Aquarium (58 percent), the Seattle Aquarium (29 percent), and the New England Aquarium (25 percent). In a major metropolitan area, such as Montreal and Chicago, a large number of activities is available to residents, the aquaria are not nearly as attractive as visitation sites, and all compete for a limited amount of available leisure time. This lowers the visitation ratio of their aquaria.

Table 1
GENERAL OPERATING CHARACTERISTICS OF SELECT CANADIAN AQUARIA, 1984[1]
(All figures in Canadian Dollars)

	Vancouver Public Aquarium Vancouver, B.C.	Montreal Aquarium Montreal, Quebec	Quebec Aquarium Quebec City, Quebec
Hours			
Summer	9:30 - 9:00	10:00 - 5:00	9:00 - 5:00
Winter	10:00 - 5:00	10:00 - 5:00	9:00 - 5:00
Operating Budget	$2,453,000	$900,000	NA
Ticket Prices			
Adult	$ 4.50[2]	$ 2.00	$ 2.00
Student	2.25	1.00	.50
Child	Free[3]	Free[3]	Free[3]
Seniors	2.25	1.00	.50
Annual Memberships			
Single	$15	--	--
Family	28	--	--
1983 Total Attendance	755,568	214,326	230,000[4]
Estimated Average Length of Stay	2.2 hours	1.5 hours	1 hour
Size	7,209 sq.m.	12,000 sq.m.	25 acres
Type of Location	Central city: in Stanley Park	Central city: in Laronde Amusement Park, Ile Ste. Helene	Suburb
Funding	Private	Municipal	Provincial
Resident Market Area	Vancouver CMA	Montreal CMA	Quebec CMA
1983 Population	1,296,400	2,847,800	578,600

1/ All dollar figures in Canadian dollars
2/ Family pass: $11.00
3/ Children 4 or younger
4/ Estimate

Source: ERA survey of individual aquaria: Sales and Marketing Management

Table 2
GENERAL OPERATING CHARACTERISTICS OF
SELECT U.S. AQUARIA, 1984
(All Figures in U.S. Dollars)

	New England Aquarium; Boston, MA	Shedd Aquarium Chicago, IL	National Aquarium Baltimore, MD	Seattle Aquarium Seattle, MD	Aquarium of Niagara Falls, Niagara Falls, NY
Hours					
Summer	M-T-TH 9-6 W-F 9-9 S-SU 9-7	9:00 - 5:00	TH-T 9-5 W 9-8	10:00 - 9:00	9:00 - 7:00
Winter	M-TH 9-5 F 9-9 S-SU 9-6	10:00 - 5:00	S-TH 10-5 F 10-8	S-TH 10-5 F 10-7	9:00 - 5:00
1984 Budget	$4,500,000	$4,286,780	$4,950,000	$1,584,000	DNA
Ticket Prices					
Adult	$5.00 1/	$2.00	$5.75	$3.25 2/	$4.50
Student	4.00	NA	4.25	1.50	2.75
Child	3.00	1.00	3.00	.75	.75
Seniors	4.00	.50	4.25	1.50	1.75
Annual Memberships					
Single	$25.00	$20.00	$20.00	$25.00	$15.00
Family	35.00	30.00	30.00	35.00	20.00
1983 Total Attendance	918,011	733,266	1,366,262 3/	494,854	147,840
Estimated Average Length of Stay	2 hours	1.5 hours	2 hours	1.75 hours	1.5 hours
Type of Location	Central city	Central city	Central city	Central city	City
Funding	Private	Private	Private	Municipal	Private
Resident Market Area	Boston Metropolitan Area	Chicago Metropolitan Area	Baltimore and Washington DC Metropolitan Areas	Seattle Metropolitan Area	Niagara Falls Metropolitan Area
1983 Population	3,652,800	6,028,500	5,611,600	1,675,400	69,200

"NA" means not applicable
"DNA" means data not available

1/ Wednesdays (summer only) and Fridays after 4:00 p.m., $1.00 off all prices
2/ Family pass: $19.95
3/ Fiscal year 82-83 (July 1, 1982-June 30, 1983)

Source: ERA survey of individual aquaria; Sales and Marketing Management; Zoological Parks and Aquariums in the Americas, 1984-85.

Table 3

PARKING AND ACCESS BY PUBLIC TRANSPORTATION
FOR SELECT CANADIAN AQUARIA

	Vancouver Public Aquarium Vancouver, B.C.	Montreal Aquarium Montreal, Quebec	Quebec Aquarium Quebec City, Quebec
Parking Facilities	Yes - throughout Stanley Park	Yes - La Ronde parking lot	Yes
Parking Fee	Free	Winter - Free Summer - $4.00	
Increased Parking Would Increase Visitation	No	No	No
Access by Public Transportation	City bus to the entrance of Stanley Park plus a 10 min. walk	Subway to Ile Ste. Helene Station; bus stops within 15 min. walk in winter; bus to the entrance in summer months	City bus to Aquarium once per hour
Better Public Transportation Would Increase Visitation	Generally, no; when raining, yes	Yes - especially in winter	Yes, if more frequent

Source: ERA survey of individual aquaria

Table 4

PARKING AND ACCESS BY PUBLIC TRANSPORTATION FOR SELECT U.S. AQUARIA

	New England Aquarium; Boston, MA	Shedd Aquarium Chicago, IL	National Aquarium Baltimore, MD	Seattle Aquarium Seattle, WA	Aquarium of Niagara Falls Niagara Falls, NY
Parking Facilities	No1/	50-60 spaces	No, but parking nearby	No, but parking nearby	Yes
Parking Fee	--	Free	--	--	Free
Increased Parking Would Increase Visitation	Yes	No - other lots available	No - street lots available	No - both metered & non-metered street parking available	No - sufficent
Access by Public Transportation	Subway to Aquarium	Suburban trains are close; bus stops at the door	City bus	Trolley stops in front; buses within walking distance	No
Better Public Transportation Would Increase Visitation	No	No	No	No	Yes

1/ Agreement with nearby deck.

Source: ERA survey of individual aquaria

Table 5

ANNUAL ATTENDANCE FOR
SELECT CANADIAN AQUARIA

	Vancouver Public Aquarium Vancouver, B.C.	Montreal Aquarium Montreal, Quebec1/	Quebec Aquarium Quebec City, Quebec3/
1983			
Total	755,568	214,326	230,000
Paid (%)	76.1	--	--
1982			
Total	638,207	231,890	227,000
Paid (%)	80.4	--	--
1981			
Total	686,478	204,482	194,000
Paid (%)	85.7	--	--
1980			
Total	708,341	220,5182/	230,000
Paid (%)	86.5	--	--
1979			
Total	707,430	460,590	254,000
Paid (%)	89.4	--	--
Average Annual Increase (Decrease)			
Total (%)	1.33	(14.19)	(1.97)
Paid (%)	(3.17)	--	--

1/ All figures are paid attendance
2/ Dolphin show discontinued in 1980
3/ Fiscal year (April-March) in thousands. Total Figures

Source: ERA survey of individual aquaria

Table 6

ANNUAL ATTENDANCE FOR SELECT
U.S. AQUARIA

	New England Aquarium Boston, MA	Shedd Aquarium Chicago, IL	Seattle Aquarium Seattle, WA	Aquarium of Niagara Falls Niagara Falls, NY
1983 - Total	918,011	733,266	494,864	147,840
Paid (%)	82.5	64.8	80.0	DNA
1982 - Total	882,943	874,900	573,198	134,972
Paid (%)	81.8	61.4	DNA	DNA
1981 - Total	926,408	950,732	636,641	140,671
Paid (%)	81.9	60.5	DNA	DNA
1980 - Total	982,144	1,091,127 1/	704,958	158,615
Paid (%)	81.7	62.1	DNA	DNA
1979 - Total	909,732	825,898	672,471	158,659
Paid (%)	DNA	56.3	DNA	DNA
AVERAGE ANNUAL INCREASE (DECREASE)				
Total (in percentage)	.18	(2.35)	(5.95)	(1.4)
Paid (in percentage)	.24	2.85	DNA	DNA

DNA means data not available

1/ Aquarium 50 year anniversary.

Source: ERA survey of individual attractions.

Table 7

MONTHLY DISTRIBUTION OF 1983 TOTAL ATTENDANCE
FOR SELECT CANADIAN AQUARIA
(IN PERCENTAGES)

	Vancouver Public Aquarium Vancouver, B.C.	Montreal Aquarium Montreal, Quebec[1]	Quebec Aquarium Quebec City, Quebec[2]	Average Distribution
January	4.5	3.0	1.5	3.0
February	4.3	4.1	2.6	3.7
March	7.8	5.4	3.5	5.6
April	10.4	5.7	5.3	7.1
May	9.2	8.3	9.2	8.9
June	9.4	14.4	17.1	13.6
July	17.4	24.4	27.1	23.0
August	17.5	19.5	19.1	18.7
September	7.2	5.8	6.5	6.5
October	4.7	4.9	4.5	4.7
November	3.4	3.0	2.8	3.1
December	4.2	1.5	0.9	2.2
	100.0	100.0	100.1	100.1

1/ Paid attendance
2/ Fiscal year 1983-1984 April-March

Source: ERA survey of individual aquaria

Table 8

MONTHLY DISTRIBUTION OF 1983 TOTAL ATTENDANCE:
FOR SELECT U.S. AQUARIA
(IN PERCENTAGES)

	New England Aquarium Boston, MA	Shedd Aquarium Chicago, IL	National Aquarium 1/ Baltimore, MD	Seattle Aquarium Seattle, WA	Aquarium of Niagara Falls, Niagara Falls, NY	Average Distribution
January	4.4	5.3	5.0	5.2	2.5	4.5
February	6.1	6.3	6.4	6.5	4.4	5.9
March	7.2	9.7	5.0	8.5	4.9	7.1
April	9.8	12.3	9.0	8.4	8.0	9.5
May	9.8	11.2	11.7	8.5	11.3	10.5
June	9.5	7.9	9.8	11.2	10.6	9.8
July	13.5	13.5	12.7	15.7	19.5	15.0
August	14.5	12.0	13.5	15.5	20.6	15.2
September	6.9	5.3	7.6	7.4	7.8	7.0
October	7.6	6.4	8.1	5.4	5.3	6.6
November	6.6	6.6	6.6	4.6	3.3	5.5
December	4.3	3.6	4.6	3.8	1.9	3.6
TOTAL	100.2	100.1	100.0	100.7	100.1	100.2

1/ For 1982.

Source: ERA survey of individual attractions.

Figure 1

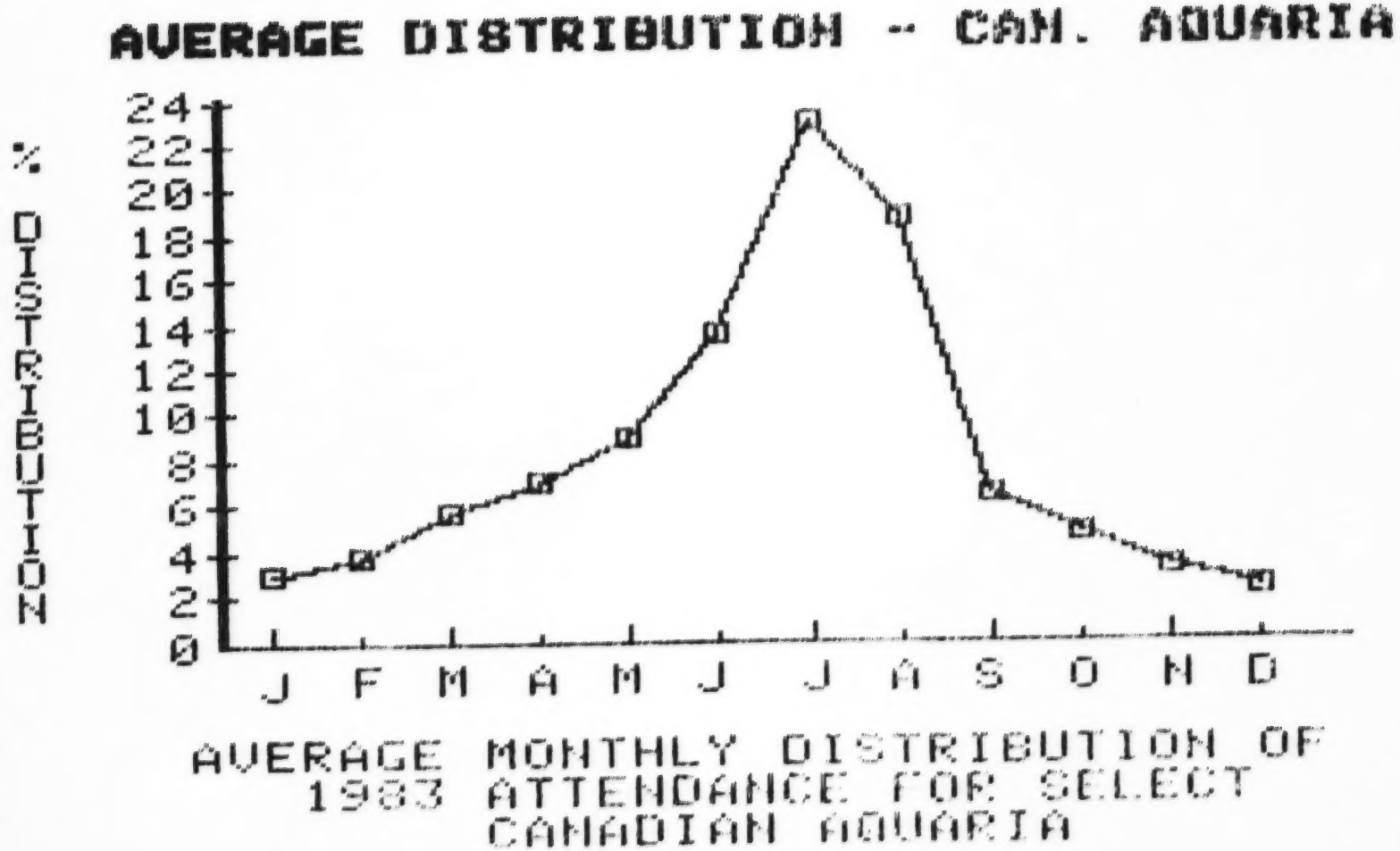

AVERAGE DISTRIBUTION -- CAN. AQUARIA
% DISTRIBUTION
24
22
20
18
16
14
12
10
8
6
4
2
0
J F M A M J J A S O N D
AVERAGE MONTHLY DISTRIBUTION OF
1983 ATTENDANCE FOR SELECT
CANADIAN AQUARIA

Figure 2

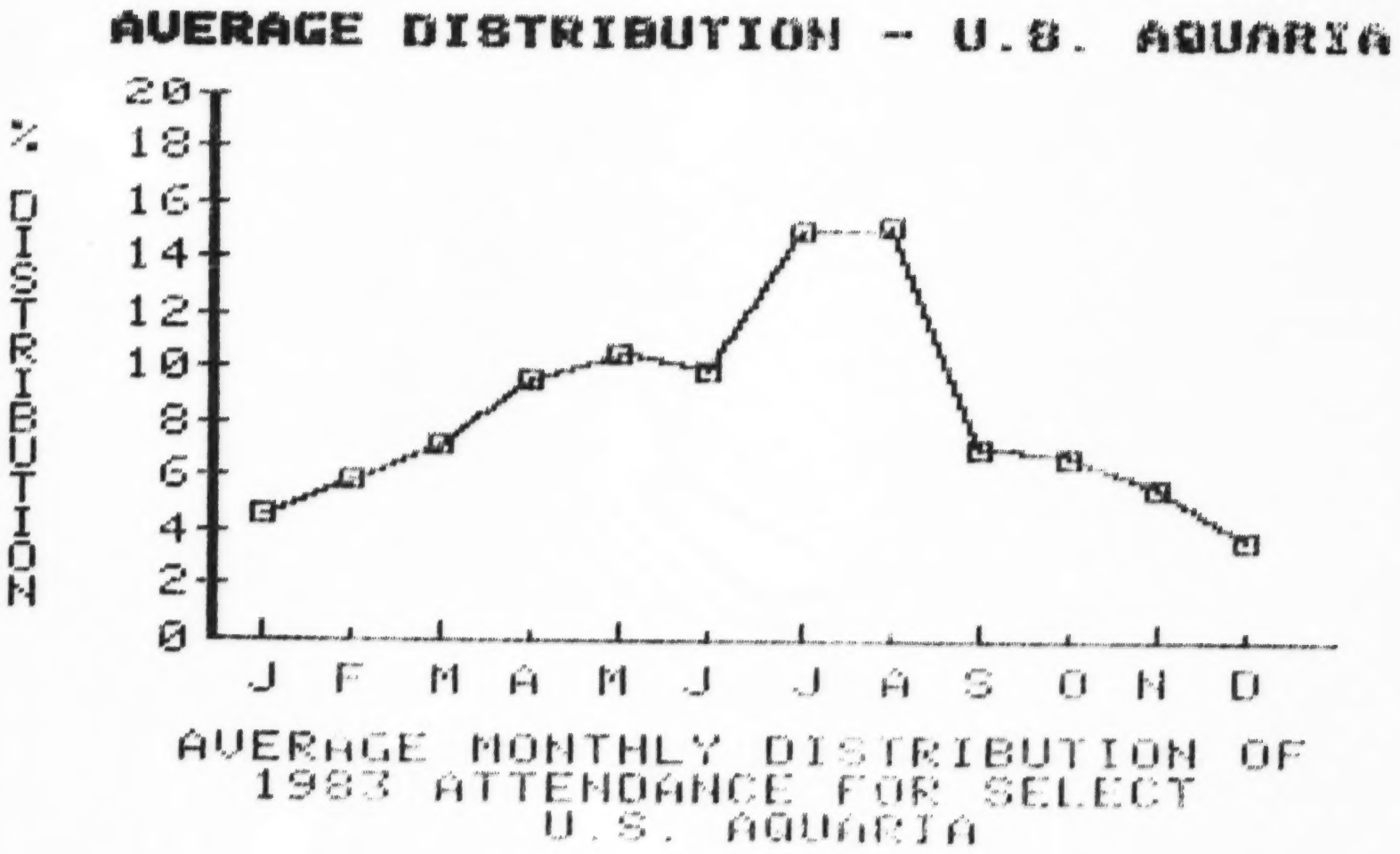

AVERAGE DISTRIBUTION - U.S. AQUARIA
% DISTRIBUTION
20
18
16
14
12
10
8
6
4
2
0
J F M A M J J A S O N D
AVERAGE MONTHLY DISTRIBUTION OF
1983 ATTENDANCE FOR SELECT
U.S. AQUARIA

Table 9

RATIO OF VISITATION TO MARKET AREA POPULATION
SELECT CANADIAN AQUARIA: 1983

	Vancouver Public Aquarium Vancouver, B.C.	Montreal Aquarium Montreal, Quebec 1/	Quebec Aquarium Quebec City, Quebec
Total Attendance	755,568	214,326	230,000 2/
CMA Population	1,296,400	2,847,800	578,600
Residential Market Penetration	58.3 %	7.5 %	39.8 %

1/ Paid attendance
2/ Fiscal year 1983 (April-March) in Thousands

Source: ERA survey of individual aquaria

Table 10

RATIO OF VISITATION TO MARKET AREA POPULATION
SELECT U.S. AQUARIA: 1983

	New England Aquarium Boston, MA	Shedd Aquarium Chicago, IL	National Aquarium Baltimore, MD	Seattle Aquarium Seattle, WA	Aquarium of Niagara Falls Niagara Falls, NY
Attendance	918,011	733,266	1,366,262[1/]	494,864	147,840[2/]
Population	3,652,800	6,028,500	5,611,600	1,675,400	69,200
Residential Market Penetration	25.1 %	12.2 %	24.4 %	29.5 %	213.6 %

1/ Fiscal year '82-'83 (July 1, 1982-June 30, 1983)
2/ Fiscal year '83-'84 (May 1, 1983-April 30, 1984)

Source: ERA survey of individual attractions.

4.2 Visitor Attractions in Toronto

The City of Toronto lies in Southern Ontario on the shores of Lake Ontario. A metropolitan area of 3.09 million people, the city is the provincial capital and boasts of a wide variety of educational, cultural, and historic attractions. Sixteen million people visited the city in 1983, including tourists, business travellers, and convention delegates, spending $2 billion. Although this number is lower than in past years (see Table 11), the downturn is attributed to economic constraints felt throughout the country. The lower number of visitors, in turn, has resulted in a 6 percent decline in attendance at metropolitan Toronto attractions (Source: Metropolitan Toronto Convention and Visitors Association).

ERA surveyed eight Toronto tourist attractions, in order to assess the current level of visitation at recreational, cultural, and historic attractions in the Toronto area. Table 12 presents operating information for the eight including hours, ticket prices, 1983 attendance, and average length of stay. Most attractions open between 9 and 11 AM and close in the late afternoon or early evening. The exceptions are Ontario Place, an entertainment center and the CN Tower, a viewing facility and restaurant. The general admission price range is $2.50 for the Royal Ontario Museum and McMichael Canadian Collection Art Gallery to $4.25 for entrance onto Ontario Place Grounds. In 1983, attendance ranged from 130,000 visitors at the McMichael Canadian Collection (predominantly area residents) to 1.6 million at the CN Tower. Parking and access by public transportation is outlined in Table 13. All attractions are served by public transportation, and most had parking available. None of the people interviewed felt more parking would increase visitation, although half said better public transportation would raise attendance levels.

Tables 14 and 15 present recent annual attendance and monthly attendance for the eight attractions. Half of the facilities have experienced an increase in attendance, while the other half have seen decreases. The McMichael Collection was closed for renovation in 1981 and first began charging admission in 1982, which accounts for its large drop in visitation. In 1983, attendance rose at the McMichael Collection.

The attractions in Toronto follow the seasonal pattern of increased attendance in the summer months. This is more pronounced for outdoor facilities such as the Metro Zoo, Black Creek Pioneer Village, and Ontario Place, which is only open in the summer months. Figure 3 graphically shows the average monthly distribution of attendance for the Metro Zoo, the Royal Ontario Museum, the Ontario Science Center, and the CN Tower. This graph demonstrates distribution of attendance an aquarium in Toronto may expect to have.

The Toronto Metropolitan Zoo is the only attraction with significant aquarium facilities. The zoo is designed so that each exhibit area homes animals of a particular geographic area. Within these exhibits some fresh water facilities and a few marine tanks are included in keeping with the geographic theme. The Royal Ontario Museum has some fish exhibits, but their 8 tank aquarium was discontinued in 1961. It is uncertain if live fish will be included in a future icthyology gallery. Neither of these facilities foresees any effect on visitation with the opening of an aquarium.

Table 11

VISITORS TO TORONTO
(Business, Convention, and Tourist)
1976-1983

1976	17.2 million
1977	18 million
1978	19 million
1979	20 million
1980	21 million
1981	21.8 million
1982	16 million
1983	16 million

Source: Metropolitan Toronto
Convention & Visitors
Bureau

Table 12
GENERAL OPERATING CHARACTERISTICS
OF SELECTED TORONTO ATTRACTIONS
(All Figures in Canadian Dollars)

	Metro Zoo	Black Creek Pioneer Village	Casa Loma	Royal Ontario Museum	McMichael Canadian Collection	Ontario Science Centre	Ontario Place	CN Tower
Hours								
Summer	9:30 - 7:00	10:00 - 6:00	10:00 - 5:00	M-SA 10-8 SU 10-6	M-SA 11-5 SU 11-8	10-6	10:00-1:00 a.m.	9:00 - 11:00
Winter	9:30 - 4:30	9:30 - 4:00	10:00 - 4:00	SA-W 10-6 TH-F 10-8	T-SU 11:30-5 M-Closed	10-6	Closed	10:00 - 10:00
Ticket Prices								
Adult	$4.00	$4.00	$3.25	$2.50	$2.50	$3.00	$4.25 1/	$4.00
Student	2.00	1.75	2.25	1.25	1.00 2/	2.00 2/	4.25 3/	3.00
Child	1.00 2/	1.00	1.00	1.25	Free 5/	1.00 2/	1.00 3/	2.50 2/
Seniors	2.00	2.00	1.25	1.25 4/	1.50 5/	Free	Free	3.50
Family Pass	--	8.00	50¢ less/ person	5.00	6.00	$7.00	--	6/
Annual: Family	35.00	25.00	--	50.00	50.00	--	--	--
Single	18.00	15.00	--	40.00	35.00	--	--	--
1983 Attendance	1,120,226	223,012*	450,000	993,222	130,000* 7/	1,016,006	2,436,880 8/	1.6 million*
Length of Stay	6 hours	3 hours	1½ hours	2 hours	2 hours	4 hours	4 hours	Varies
Funding (Operating Budget)	Metropolitan Toronto	Metropolitan Toronto and Region Conservation Authority	Private	Provincial Government	Private with some Provincial support	Provincial Government	Crown Corp.	Private
Resident Market Area	Toronto CMA	Toronto CMA	Toronto CMA	Toronto CMA	Toronto CMA	Toronto CMA	Toronto CMA	Toronto CMA
1981 Population	3,090,000	3,090,000	3,090,000	3,090,000	3,090,000	3,090,000	3,090,000	3,090,000

* Estimate

1/ 13 years and older
2/ Under 5, free
3/ $2.50 if unaccompanied by adult
4/ Tuesdays free
5/ Wednesday free
6/ Travel groups over 20 people: 15% reduction; other groups over 20 people: 10% reduction
7/ May 1983 - April 1984
8/ Includes CNE visitation equaling 36% of Total

Source: ERA survey of individual attractions

Table 13

PARKING AND PUBLIC TRANSPORTATION
ACCESS FOR SELECT TORONTO ATTRACTIONS
(All Figures in Canadian Dollars)

	Metro Zoo	Black Creek Pioneer Village	Casa Loma	Royal Ontario Museum	McMichael Canadian Collection	Ontario Science Center	Ontario Place	CN Tower
Parking Facilities	2,500 + 500 overflow	200 +	275	None	275-300	Yes	2,000	Yes
Fee	$2. for lot -overflow free	Free	Free	--	Free	$1.00	$3.50 average	$2.50
Increased Parking Would Increase Visitation	No*	No	No*	No- parking within walking distance	No*	No	No*	No
Access by Public Transportation	Subway & Bus	Subway & Bus	Subway, Bus, & walk	Subway & Bus stop	Bus	Subway and bus	Bus drops 1/4 mile away	Bus to door - subway within walking distance
Better Public Transportation Would Increase Visitation	Would like Express Bus from Shuttle to decrease time	No	Yes	No	No	No	Yes- walk could be deterrant	Better if subway extended

* Occasional overcrowding

Source: ERA survey of individual attractions.

Table 14

ANNUAL ATTENDANCE FOR SELECT TORONTO ATTRACTIONS

	Metro Zoo	Black Creek Pioneer Village	Casa Loma	Royal Ontario Museum	McMichael Canadian Collection[1]	Ontario Science Center	Ontario Place[2]	CN Tower
1979	1,097,692	285,211	NA	903,065	287,564	1,404,559	NA	1,600,000
1980	1,018,401	280,375	NA	642,193[3]	286,563	1,350,121	NA	1,600,000
1981	1,078,673	262,894	NA	297,202[3]	220,680[3]	1,359,392	NA	1,600,000
1982	1,129,393	265,784	NA	452,558[3]	119,559[4]	1,610,090	2,338,200	1,600,000
1983	1,120,226	223,012	450,000	993,222	128,886	1,016,006	2,426,800	1,600,000[5]
Average Annual Increase (Decrease) in Percentage	.41%	(4.80%)	--	1.92%	(14.83%)	(6.27%)	1.88%	--

"NA" = not available

1/ Fiscal Year: April 1, year listed - March 31, following year.
2/ 1984 Attendance: 2,111,000.
3/ Part or all of building closed for renovation.
4/ First year charged admission.
5/ Average attendance.

Source: ERA survey of individual attractions.

Table 15

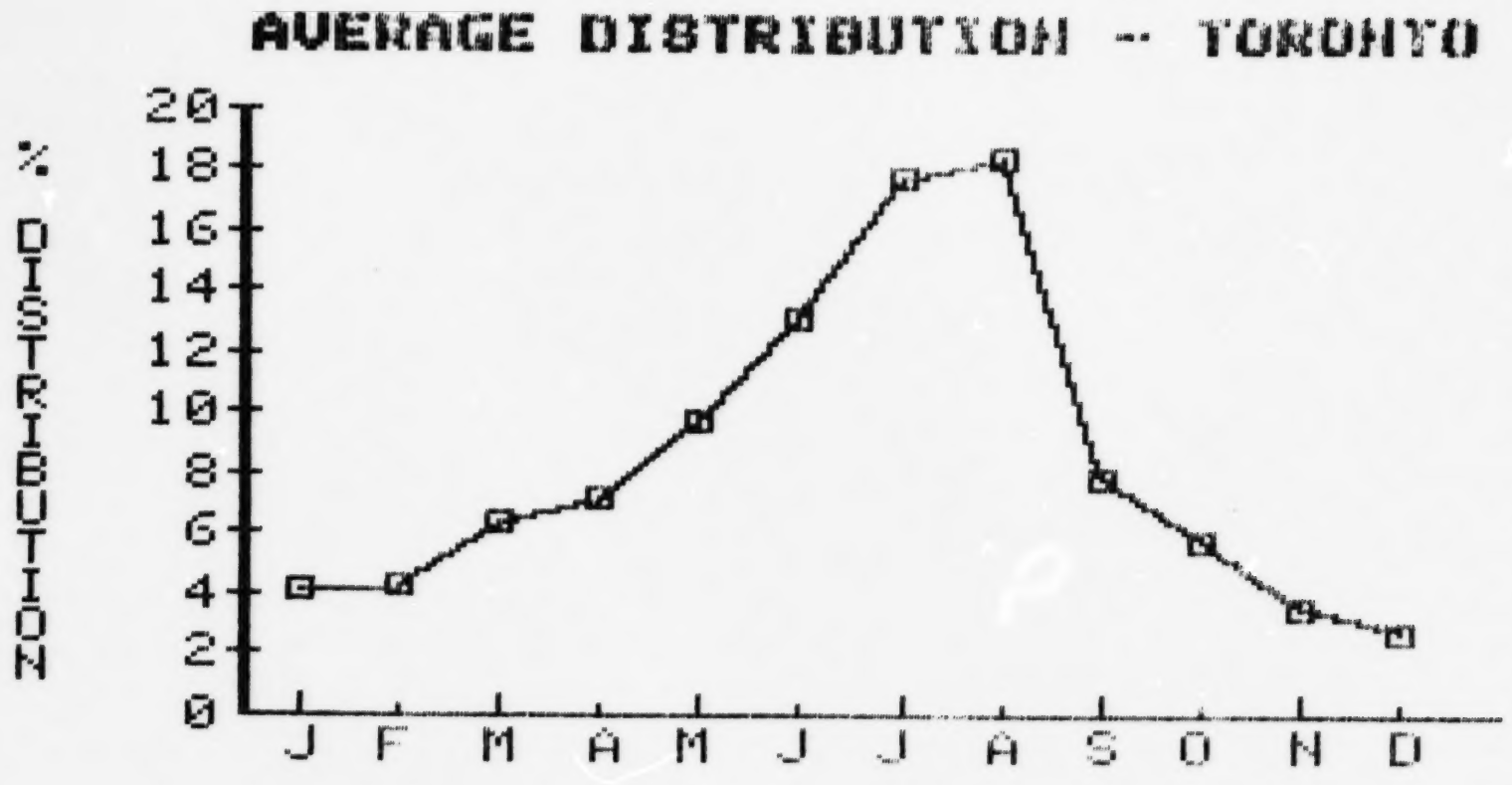
MONTHLY DISTRIBUTION OF 1983 ATTENDANCE
FOR SELECT TORONTO ATTRACTIONS
(IN PERCENTAGES)

	Metro Zoo*	Black Creek Pioneer Village	Casa Loma	Royal Ontario Museum	McMichael Canadian Collection[2/]	Ontario Science Centre*	Ontario Place	CN Tower*	Average Distributic of Starred Facilities
January	1.7	0.4[1/]	NA	4.4	4.9	8.2	--	2.5	4.1
February	2.5	0.8	NA	7.4	4.6	7.2	--	3.1	4.3
March	3.9	2.4	NA	12.4[4/]	5.4	9.7	--	5.2	6.3
April	6.1	7.3	NA	12.1	4.8	8.4	--	6.7	7.1
May	10.5	11.2	NA	12.5	12.0	9.7	5.6	8.9	9.7
June	19.2	10.7	NA	8.6	10.7	9.0	16.6	11.1	13.1
July	19.6	13.5	NA	7.7	10.5	13.1	26.4	20.5	17.7
August	19.1	14.5	NA	6.3	10.5	15.5	51.5[3/]	20.2	18.3
September	8.8	10.8	NA	4.3	9.9	5.3	--	9.2	7.8
October	5.5	11.2	NA	7.9	16.5	5.1	--	6.6	5.7
November	1.7	6.4	NA	9.4	6.1	5.0	--	3.6	3.4
December	1.3	10.9	NA	7.1	4.1	3.9	--	2.5	2.6
TOTAL	99.9	100.1	NA	100.1	100.0	100.1	100.1	100.1	100.1

1/ Buildings open for limited access only January-March 15.
2/ Fiscal year '83-'84 (April-March)
3/ Includes some CNE Attendance.
4/ During March, April, May, and June international exhibitions were on display, doubling attendance.

Source: ERA Survey of individual attractions.

Figure 3



AVERAGE MONTHLY DISTRIBUTION OF
1983 ATTENDANCE FOR SELECT
TORONTO ATTRACTIONS

4.3 Toronto Aquarium Attendance Projections

As in any work of this kind, a number of assumptions have been made about the design and operation of the proposed aquarium. It is important to recognize that projections of potential attendance are predicated on the assumption that:

- The design of the new facility and its exhibits will serve to create a high quality, stimulating attraction with broad based audience appeal and a distinctive image.
- The facility will be competently and effectively managed.
- An aggressive promotional campaign will be developed and implemented.
- The aquarium will be open to the public on a year-round basis.
- There will be no physical constraints to impede visitors to the facility.

Attendance projections for the proposed Aquarium are summarized by the data in Table 16. A stable year attendance of visitors is projected with 40 percent of the year's total occurring during the peak months of July and August. A stable year is defined as a year in which the Aquarium is fully operating with no major events or obstructions affecting attendance. The first and second years of operation are not considered stable years and may have higher attendance as it is a new facility.

Economics Research Associates projects annual attendance of 750,000 to 900,000 visitors for the Toronto Aquarium. This projection is based on the attractiveness of an aquarium at a range of sites, as outlined in the prior sections of this report. Some of the sites will be able to achieve higher levels of attendance than others, and this range of attendance was generated to reflect these differences. The sites on the central waterfront will generate visitation levels approaching 900,000 visitors, while those more removed will likely generate visitation levels nearer 750,000 visitors. At this level the

aquarium will achieve a visitation ratio of 24-29 percent, comparable with the New England Aquarium in Boston and the Seattle Aquarium. In the months of July and August 300,000 to 360,000 visitors may be expected. Average weekly attendance during the two month peak period would fall within the range of 33,870-44,645 visitors. Average high day counts during this period are projected to reach 6,774-8,129 visitors.

Assuming a two hour average length of stay, peak accumulations of visitors within the facility would range from 2,032-2,439 people if the facility were operated on an eight hour day basis. Under a twelve hour day operating schedule, peak accumulations would be reduced to 1,219-1,463 visitors. A twelve hour day may therefore, be a useful method of reducing crowd friction during the summer peak season, as well as a means of increasing attendance overall.

Parking requirements are also a function of peak visitor accumulations in the aquarium on a high day for visitation. Assuming 85 percent of the visitors arrive by car at an average of 3.2 visitors per car, staying an average of two hours, the average high day during peak season would produce a peak parking accumulation of 540-648 cars during a eight hour operating day, or 324-389 cars during a twelve hour day.

Table 16

TORONTO AQUARIUM
ATTENDANCE PROJECTIONS

Total Visitors (Stable Year)	750,000-900,000
Peak Two Months Attendance (40 percent of total)	300,000-360,000
Average weekly Attendance During Peak Two Months (8.857 weeks)	33,870- 44,645
Average High Day (20 percent)	6,774- 8,129
Range of Peak in Facility Attendance1/	
8 hour day basis (30 percent)	2,032- 2,439
12 hour day basis (18 percent)	1,219- 1,463
Range of Parking Accumulation2/ (Automobile) (3.2 visitors/car)	
8 hour day basis	540- 648
12 hour day basis	324- 389

1/ Assumes 2 hour average length of stay for total facility.
2/ Assumes on average high day that 85 percent arrive at site by automobile. Average high days will likely occur on weekend days.

Source: Economics Research Associates

4.4 Toronto Aquarium Financial Operating Characteristics

Revenues, Expenses and Net Operating Profit(Loss) for the Toronto Aquarium were gauged based on financial data at comparable aquaria. Four facilities provided this information: the Vancouver Public Aquarium, the New England Aquarium, the Baltimore National Aquarium, and the Aquarium of Niagara Falls. The stable year attendance of 750,000 to 900,000 aquarium visitors were used when projecting Toronto Aquarium expenses and revenues. Again, the attendance projections are for an aquarium located at a number of sites, rather than targeted at any chosen site.

Review of Aquaria Financial Data

Based on annual financial reports, ERA derived operating revenues and expenses by dollar amount, per visitor, per capita, per square meter, and percentage of total for the 4 aquaria. In the 1983 Fiscal Year the Vancouver Aquarium and Baltimore National Aquarium reported operating gains whereas the New England Aquarium and Aquarium of Niagara Falls experienced operating losses. Table 17 provides dollar figures for each aquarium.

Per capita revenues were highest for the Aquarium of Niagara Falls, with a total of U.S. $6.62/visitor. The lowest were at the Vancouver Public Aquarium. Vancouver also has the lowest per capita expenses. The Aquarium at Niagara Falls and the New England Aquarium experienced the highest operating expenses. Admissions ranged between 40.9 percent of total income (Aquarium of Niagara Falls) and 71.4 percent (Baltimore National). Exhibit Development and Display and Administration and Accounting, on the average, were the highest expenses.

Toronto Aquarium Operating Profile

Some assumptions regarding the Toronto Aquarium were made after reviewing the exhibit program described earlier in the report. This information was important to estimate expenses and revenues for the facility. First, ERA assumed winter operating hours of 9 am to 5 pm and summer hours of 9 am to 7 pm. The later summer hours allow the facility to capitalize on the warmer weather, beautiful view, and increases in summer visitation. Summer hours run from Victoria Day (3rd weekend of May) through Labour Day (first weekend of September).

Also, an adult ticket price of $5.00 was assumed. Of the original eight aquaria, children's prices ranged from 50-60 percent of adult costs. At Toronto attractions, this range widens to 25-62 percent. ERA, therefore, used 50 percent of adult ticket price to determine children's entrance fees. It is estimated that the average visitor would spend 2 hours in the proposed aquarium.

Achievable Operating Costs

To arrive at a range of operating costs for the Toronto facility, ERA evaluated comparable expenditure levels from the Baltimore National Aquarium, the New England Aquarium, the Vancouver Public Aquarium, and the Aquarium of Niagara Falls. The results of the operating cost evaluation are presented in Table 18.

One category, Education and Research, was estimated as a fixed cost of $500,000, approximately that of the Baltimore National Aquarium. The Exhibit Development and Display Expense is estimated at approximately $108/m², and Facilities Expense is estimated at roughly $129/m². At $1.25 per visitor, the Administrative & Accounting expense figure varies within the range of visitors. Retail Sales and Restaurant Sales Expenses both are estimated as 40 percent of their Revenues, or $.36/visitor and $.38/visitor, respectively.

Using this methodology, the expenses at attendance of 750,000 are estimated at $4,872,050. When visitation is increased to 900,000 visitors, expenses also increase slightly, to $5,170,550.

Achievable Operating Revenues

The range of operating revenues is dependent on the number of visitors, and is shown in Table 18. Using a $5.00 adult admission and $2.50 admission for children (and taking into account free and other admissions factors), ERA estimates that admissions revenue will approximate $2,700,000 with 750,000 visitors, and $3,240,000 at the 900,000 visitors level. Retail and restaurant revenues are estimated at $.90 and $.95 per visitor. The Other Revenue category is estimated at $500,000, and would include investment earnings, grants and donations, and other revenues.

Summary of Operating Surplus (Loss)

Operating profit (loss) may be determined at each operating cost and revenue level. Data in Table 18 present a summary of the estimated annual operating surplus (loss). With 750,000 visitors and a $5.00 adult entrance fee, the operating surplus is estimated at $115,450. The surplus increases to $634,4500 at the higher number of 900,000 visitors. At this point in the feasibility analysis it appears that the proposed aquarium could draw sufficient operating revenues and be designed to minimize operating costs so that a successful financial operation in a stable year may be achieved.

Table 17

FISCAL YEAR REVENUE AND EXPENSES
FOR SELECT NORTH AMERICAN AQUARIA
1982/1983

	VANCOUVER PUBLIC AQUARIUM (In Canadian Dollars)				NEW ENGLAND AQUARIUM (In U.S. Dollars)			
	Total	Per Capita	Per Square Metre	Percent of Total	Total	Per Capita	Per Square Metre	Percent of Total
REVENUE								
Total	$2,844,332	$3.76	$394.55	100.0%	$5,263,535	$5.72	$728.41	100.0%
Admissions	1,988,763	2.63	275.87	69.9	3,391,097	3.69	469.29	64.4
Sales	302,640[1/]	.40	41.98	10.7	608,093	.66	84.15	11.6
Memberships	299,797	.40	41.59	10.6	500,114	.54	69.21	9.5
Investment Earnings	--	--	--	--	49,418	.05	6.84	0.9
Grants & Donations	83,774	.11	11.62	2.9	631,007[2/]	.69	87.32	12.0
Other	169,358	.22	23.49	5.9	83,806	.09	11.60	1.6
EXPENSES								
Total	$2,797,994	$3.71	$388.13	100.0%	$5,676,635	$6.20	$785.59	100.0%
Education & Research	403,611[3/]	.53	55.99	14.4	804,295	.88	111.31	14.2
Exhibit Dev. & Display	868,076	1.15	120.42	31.0	878,446	.96	121.57	15.5
Facilities	714,495	.95	99.11	25.6	2,008,054	2.19	277.89	35.4
Admin. & Accounting	413,877	.55	57.41	14.8	1,503,489	1.64	208.07	26.5
Attendance & Membership	397,935	.53	55.20	14.2	--	--	--	--
Sales Operations	--	--	--	--	482,351	.53	66.75	8.5
ATTENDANCE		755,568				918,011		
OPERATING SURPLUS (Loss)	$ 46,338				($413,100)[4/]			

1/ Less cost of sales and direct expense
2/ Includes research contracts
3/ Includes specimen care and display
4/ Includes $698,889 in depreciation and amortization

Table 17
FISCAL YEAR REVENUE AND EXPENSES
FOR SELECT NORTH AMERICAN AQUARIA
1982/1983
(continued)

	NATIONAL AQUARIUM IN BALTIMORE (In U.S. Dollars)				AQUARIUM OF NIAGARA FALLS (In U.S. Dollars)			
	Total	Per Capita	Per Square Metre	Percent of Total	Total	Per Capita	Per Square Metre	Percent of Total
REVENUE								
Total	$6,777,543	$4.96	$510.12	100.0%	$ 892,786	$6.62	$218.41	99.9%
Admissions	4,841,025[5]	3.54	364.36	71.4	365,439	2.71	89.40	40.9
Sales	478,793[6]	.35	36.04	7.1	82,410[6]	.61	20.16	9.2
Memberships	618,243	.45	46.53	9.1	15,553	.12	3.80	1.7
Investment Earnings	419,953	.31	31.61	6.2	14,948	.11	3.66	1.7
Grants & Donations	--	--	--	--	348,598[7]	2.58	85.28	39.0
Other	419,529	.31	31.58	6.2	65,838	.49	16.11	7.4
EXPENSES								
Total	$4,766,191	$3.49	$358.73	100.0%	$ 935,268	$6.93	$228.81	100.0%
Education & Research	422,735	.32	33.32	9.3	75,243	.56	18.41	8.0
Exhibit Dev. & Display	908,148	.67	68.35	19.1	366,244	2.71	89.60	39.2
Facilities	1,641,924	1.20	123.58	34.4	149,338	1.11	36.53	16.0
Administration & Accounting	1,020,214	.75	76.79	21.4	213,598	1.58	52.26	22.8
Attendance & Membership	753,170	.55	56.59	15.8	37,688	.28	9.22	4.0
Sales Operations	--	--	--	--	93,157[8]	.69	22.79	10.0
ATTENDANCE		1,366,262[9]				134,972		
OPERATING SURPLUS (Loss)	$2,011,352				($42,482)[10]			

5/ Includes Group and special events
6/ Auxiliary services
7/ Includes donated services
8/ Auxiliary operations
9/ Attendance and financial figures are for the 1982-1983 fiscal year.
10/ This includes $115.429 in depreciation

Source: Individual Aquaria and Economics Research Associates

Table 18

SUMMARY OF ANNUAL OPERATING SURPLUS (LOSS)
BASED ON 750,000 and 900,000 VISITORS

	750,000 Visitors	900,000 Visitors
EXPENSES		
Education & Research 1/	$ 500,000	$ 500,000
Exhibit Development & Display 2/	1,312,200	1,312,200
Facilities 3/	1,567,350	1,567,350
Administration & Accounting 4/	937,500	1,125,000
Retail Sales 5/	270,000	324,000
Restaurant Sales 6/	285,000	342,000
TOTAL EXPENSES	$4,872,050	$5,170,550
REVENUES		
Admissions 7/	$2,700,000	$3,240,000
Membership 8/	400,000	400,000
Retail Sales 9/	675,000	810,000
Restaurant Sales 10/	712,500	855,000
Other 11/	500,000	500,000
TOTAL REVENUES	$4,987,500	$5,805,000
OPERATING SURPLUS (LOSS)	$ 115,450	$ 634,450

1/ Set Expense based on Baltimore National Aquarium experience
2/ $108/sq. m. x 12,150 square metre
3/ $129/sq. m. x 12,150 square metre
4/ $1.25 per visitor
5/ 40% of $.90 sales/visitor = $.36/visitor
6/ 40% of $.95 sales/visitor = $.38/visitor
7/ 90% visitors pay full admission ($5.00 adults, $2.50 children); 60% are adults
8/ 10,000 members at $40/membership
9/ $.90 sales/visitor
10/ $.95 sales/visitor
11/ Includes investment earnings, private grants & donations, and other revenues

Source: Economics Research Associates

4.5 Alternative Site Analysis

The project team evaluated 12 sites, as discussed in the body of this report. These sites included the Sunnyside Pavilion, Ontario Place Grounds, Stadium Road, Maple Leaf Quay East, and Marine Terminal 27 (MT 27). The two favoured sites, Maple Leaf Quay East and MT 27, provide the space, site characteristics, and locale most desirable for the Toronto Aquarium.

In reviewing these sites, the range of potential visitation was developed with many of the sites expected to draw visitors at the lower range and other sites, notably the Maple Leaf Quay East and the MT 27 sites, providing the opportunity for achieving the high end range of visitation. As indicated in the prior section, the low range visitation is closer to a break-even situation, while the high range visitation sites will result in a positive cash flow for operations of the proposed Aquarium.

For the central waterfront sites the proposed Aquarium will be one facility in a mixed-use development site including residential, commercial, and possibly, hotel facilities. This will likely be a key factor in its success. As the length of stay at an aquarium is relatively short (2 hours) compared to other mass attractions, visitation increases when other attractions are directly adjacent or within walking distance. An aquarium is more likely to become a destination site only when surrounded with enough activities to fill a day's stay. Examples of this include the New England Aquarium, within walking distance of Faneuil Hall, the Seattle Aquarium on Seattle's active waterfront, and the National Aquarium located in Baltimore's Inner Harbor. For instance, based on surveys in Baltimore, only 15 to 20 percent of visitors to the National Aquarium terminate their Inner Harbor visits after the aquarium. Two-thirds of the Aquarium's patrons also visit Harborplace, a major retail waterfront development. The remaining 10 to 15 percent of visitors attended other secondary attractions as well as the aquarium and Harborfront.

The two central waterfront sites provide sufficient land area and a good location for a mixed-use development. Maple Leaf Quay East, located at the western edge of

Harbourfront, is a 15,600 m² site described in the body of the report. The development at this site might consist of the Aquarium, multi-family residences, retail, an open plaza, restaurants, and parking facilities. Other possible tenants/developments include a health club, cinema, and satellite museum exhibits.

The second site, Marine Terminal 27 (MT 27), also is described in the main text. The aquarium, including an open plaza, would claim approximately one-third of the 43,000 m² site. Located at the foot of Yonge Street, development here would draw people from downtown Toronto and the Harbourfront. The scheme calls for the aquarium as a focal point, a hotel, parking facilities, specialty retail, restaurants, and possibly residential development, all looking in on the Aquarium and open aquatic exhibits.

Visitation at the two sites would draw from the surrounding development, area residents attracted by the total waterfront experience, and visitors to the Toronto area. Both sites would support year-round activity; Maple Leaf Quay East includes multi-family residences connected directly by an overpass, and MT 27 includes a hotel and possibly some residential development. Although this would not nullify the seasonal patterns of visitation, it is forseen to increase fall and winter visitation.

4.6 Funding Considerations

The currently proposed plan for financing the Toronto Aquarium calls for a variety of funding sources. It is anticipated that approximately 40 percent of funding will be raised from the private sector and 60 percent will be attributable to the public sector. A general approach has been outlined by the project sponsors and is described below.

Proposed Organization

Two organizations have been established in connection with the Aquarium. The Toronto Seaquarium Corporation has received Federal and Provincial approval for full tax exempt status. Its directors will consist of members of the Toronto Seaquarium Foundation, representatives of federal, provincial, and municipal governments, academics recognized in the field of ichthyology, managers and private citizens. The Toronto Seaquarium Foundation has been approved at the Federal and Provincial Government levels and has received its charter as a learning and teaching institution.

The Corporation is responsible for general fund raising for the physical plant and exhibits. Thirty-seven different agencies at both levels of government have been earmarked as sources of funding opportunities. Preliminary estimates by the Corporation's auditors call for $3.5 million to be raised at this level. The Toronto Aquarium will have retail, auditorium, and other commercial space used for private party rentals. The Seattle Aquarium as well as others has been very successful within this type of financing.

Another source of funding is through corporate contribution and sponsorship. Three types of sponsorship are recognized at this level: a one time contribution, a contribution toward construction plus an on-going endowment, and an on-going endowment. Under another sponsorship program the corporation pays the initial capital investment for a particular element within the attraction. In return for this investment, the corporate sponsor receives limited rights of product identification within the attraction, and is featured in the attraction's own promotion. Sponsor products also may be sold in the

facility on an exclusive basis in the dining areas, concessions, gift shops, etc. For example, in Sea World, corporate sponsors include Coca Cola (seal and otter show), Mercury Outboard (water ski show), Arco (world of the Sea), etc. This is a common source of financing for commercial recreation attractions, but is less common in publicly funded attractions.

In addition to corporate sponsorship, it is assumed that more traditional public/corporate fund raising would be employed as part of the financing structure for the public/nonprofit ownership option. Fund raising drives are most successful when focussed upon a particular element, such as specimen acquisition, landscaping, or film presentations.

The Toronto Seaquarium Corporation may explore innovative sources of private funding. Museums and other institutions increasingly are turning to real estate developers as tax money for art and education facilities is being reduced. One example is the capital financing for the Battery Park City Marine Attraction in New York City. The city plans to pass an industrial revenue bond which will be purchased by a single private developer. In effect, the developer is financing the capital costs of building the attraction which is considered as a key part of the overall mixed use development.

The Norwalk Maritime Center in Norwalk, Connecticut is another example of capital financing strategy using public and private funding. The Norwalk Maritime Center is an aquarium and historical museum with associated commercial development. Out of a total capital cost of approximately U.S. $20 million, the package called for 33 percent borrowed at commercial rates, 13 percent borrowed through an Urban Development Action Grant, 21 percent from a limited partnership investment, 5 percent from the City of Norwalk, and the remainder from contributions and grants. This is the innovative type of funding mix which some newer facilities are pursuing.

The Toronto Seaquarium Foundation can receive Federal and Provincial grants for teaching and education. Its responsibilities will be to act as liaison officer with universities, high schools, grammar schools, and other educational groups and to provide and develop a teaching

tour of aquatic life exhibits. The Foundation may receive funding from corporations or other private foundations.

The funding strategy of two organizations responsible for fund-raising must ensure that all possible sources be explored. As the plan is implemented a public-private financing approach is considered to be appropriate and should result in the maximum amount of fund raising for the capital costs of the facility.

Funding Strategy

An assessment of the response to such a project is difficult if not impossible without the benefit of a proper fund-raising study. Such studies involve in-depth interviews with selected senior corporate and foundation executives and other individuals who are representative of the various sources of potential support. The study should be undertaken by experienced fund-raising consultants who will provide a frank, disinterested and impartial analysis and present a plan of campaign based on their findings.

With the proliferation of major capital campaigns now underway and being planned in the Toronto area, great care must be taken to launch this project only after very careful planning, under the most auspicious sponsorship and when public awareness has been generated.

Capital campaigns of this size will require at least 18 months to two years to organize and bring to completion - after top leadership has been identified and recruited.

A five year pledge period for donations will probably have to be considered.

5. Cost Analysis

5.1 Capital Costs

1. Construction Costs

(a) Net Building Cost

In order to derive an approximate estimate of the construction costs for the proposed Toronto Aquarium prior to designing the facility, it is necessary to consider the costs of other similar facilities. To achieve the desired results, the space program and trade breakdown of the contractor's costs for other acquaria were sought. The trade breakdown enables a more accurate transportation through time and geography of the project's costs. Material costs, labour wage rates and productivity factors vary from one location to another and the variance differs at different points in time. The space program for the National Aquarium in Baltimore was available for comparison and was reasonably close in content to the program for the Toronto Aquarium. The trade breakdown for this project was also available.

Using Construction Cost Trends Indexes and supported by other building cost indexes, the trade breakdown for the National Aquarium in Baltimore was converted from the then current 1978 U.S. dollars in Baltimore to current fourth quarter 1984 dollars in Toronto.

The resulting trade breakdown, which represented the current tender price of the Baltimore Aquarium in Toronto, was based on a building area of 143,071 square feet.

The building construction cost was then roughly divided into the various functional areas in the space program. Since the program for the Baltimore and Toronto Aquaria are very similar, it was not necessary to divide the project costs of Baltimore any more accurately than this, nor would it have been within the scope of this study, since to do so would require an extensive analysis of the Baltimore tender documents and costs.

The rates derived from the apportioned costs divided by the functional areas were then applied to the functional areas listed in the program for the Toronto Aquarium.

Using this method the resulting net building cost was $29,170,000.

(b) Exhibit Equipment and Furnishings

A provisional amount has been included to provide for items of exhibit equipment and all loose furniture - $1,000,000.

(c) Site Development

A provisional amount has been included to provide for general and normal site development costs, being: landscaping and paving, signs and signage, sewers, water, gas lines and hydro lines - $500,000.

2. General Contingency

Over and above the foregoing budget components, a separate and necessary provision has been made for a contingency to provide for design, detailing and pricing unknowns extant at time of this budget preparation. This fund may be drawn upon as required during conceptual design and working drawing development and may also be the fund into which any predicted under-runs could be collected. This allowance is equivalent to five percent of the total of the foregoing costs - $1,530,000

3. Professional Fees and Expenses

Based upon the foregoing budget items, a preliminary estimate has been made for professional fees and expenses likely to be incurred for the project. These comprise: Architects; Lanscape Architects; Aquarium Consultants; Structural, Electrical and Mechanical Engineering Consultants; Cost and Time Control Consultants; Acoustic, Lighting and Audio Visual Consultants. In addition various expenses will be incurred on a cost-reimbursement basis by several consultants.

This estimte amounts to approximately - $3,860,000

4. Start Up Costs

Some of the aquarium staff will be engaged during the design and construction phases to provide input to the design process and to ensure an orderly handover and commissioning of the building. An allowance has been made for the salary costs of these employees up to the opening date, together with fund raising, promotional staff costs and purchase of general equipment. The allowance includes for all pre-opening operating costs and the cost of the opening ceremony - $2,200,000.

5. Animal Procurement Costs

A provisional amount has been included for the procurement of the animals - $300,000

6. Inclusions and Exclusions

The budget provides for capital costs necessary for the project, including all of the above items. It does not provide for: land costs; legal fees and expenses; financing costs; links to adjacent properties; parking facilities; escalation beyond November 1984, except the escalation which occurs in the period of construction; i.e. the estimate of construction costs reflects a lump sum tender price which would include the escalation in construction costs which occurs in the construction period.

5.2 Capital Budget

1. CONSTRUCTION COSTS		
(a) Net Building Cost (Gross Floor Area: 12,150m²)		$29,170,000
(b) Exhibit Equipment and Furnishings Allowance		1,000,000
(c) Site Development Allowance		500,000
2. GENERAL CONTINGENCY	5%	1,530,000
SUB TOTAL		$32,200,000
3. PROFESSIONAL FEES AND EXPENSES		3,860,000
4. START UP COSTS		2,200,000
5. ANIMAL PROCUREMENT COSTS		300,000
TOTAL CAPITAL BUDGET (NOVEMBER 1984 DOLLARS)		$38,560,000

EXCLUSIONS:

1. LAND COSTS
2. LEGAL FEES AND EXPENSES
3. FINANCING COSTS
4. LINKS TO ADJACENT PROPERTIES
5. PARKING FACILITIES
6. ESCALATION CONTINGENCY

6. Summary

6.1 Summary of Findings

Toronto has an opportunity to create a major new institution, one that will add to, and reinforce, the City's already established menu of attractions and educational resources.

The Aquarium can distinguish itself from other urban aquariums of North America by concentrating on the diverse aquatic environments and animals of Canada. Consideration of aquarium size, in reference to Toronto and its market area, suggests that it should be comparable to precedents set in U.S. cities such as Boston and Baltimore. The National Aquarium in Baltimore has been used as a primary comparative base, in regard to possible size and probable costs of construction and operation.

If fund raising capability in Toronto proves unable to achieve the full program outlined here, that program's scope should be considered a longer term objective, and an initial program of reduced scope should be considered, to be followed by incremental phases of expansion.

Any reductions of scope would require consideration of maintaining "critical mass," adequate drawing power to achieve income well in excess of operating cost.

Site opportunities identified in this study were twelve, reduced through analysis to four, followed by recommendation of two.

The two recommended sites which satisfied to a greater degree the physical criteria of control, location, size access, etc., were the Harbourfront Maple Leaf Quay site and the Harbour Commissioners/Torstar M-27 site. These sites also afforded the unique opportunity for a symbiotic relationship between an urban aquarium and a mixed-use development.

Aquarium development on either site would contribute substantially to use, enjoyment and economic success of Toronto's downtown waterfront.

In order to carry out our analysis of each site a functional program was developed to help formulate a conceptual idea of the Aquarium's physical volume. The

preparation of this program followed the development of the exhibit content which described in detail the fundamental purposes of the Aquarium and what was to be achieved. The Aquarium is envisaged to be "a facility which concentrates on the accurate simulation of natural environments". There is no doubt in the minds of the authors of this report that there exists an opportunity to develop a facility which will herald a new frontier in exhibit design for live mammals. The Aquarium will become a living educational and research element available to all residents of Canada to enjoy.

All traffic and parking studies were carried out by Barton-Aschman. The basis of their studies was the use of extensive past work carried out in the central waterfront area. The two recommended sites scored highly in terms of accessibility both by automobile and public transit. The ability to reach each site on foot in a comfortable time span also proved to give the selected sites greater emphasis

Both of the recommended sites were tested vis-a-vis their economic viability, both with respect to their marketing viability as well as their ability to sustain an on-going self supporting element. Economic Research Associates have concluded that the selected sites afford the greatest viability of success. They have forecast that the Aquarium should produce a net operating surplus anywhere between $118,280 to $637,280 based on 750,000 and 900,000 visitors per annum. There is no reason not to believe that these figures could be exceeded with proper marketing strategy.

Together with the above, Hanscomb Associates have developed extensive studies in order to establish a capital cost for the proposed Aquarium. Their costs were based on the Baltimore Aquarium costs projected to 1984 dollars. The conclusions reached were that the base building and built in exhibit functions would cost approximately twenty-nine million dollars ($29,000,000). In addition to these costs were habitat, furnishings, graphic exhibits, audio visual, site work and a contingency factor of 5% which brought the costs to approximately thirty-two million dollars.

The balance of the soft costs identified are the professional consulting fees animal procurement cost, cost of Director of Operations, fund raising expenses and start up operational costs.

In summary the conclusions of our accumulated data shows that if the initial capital funding is put in place then Toronto will not only have a world class aquarium but will also have an aquarium which will have an operating surplus.

BALTIMORE AQUARIUM

Appendix

A

PROPOSED TORONTO AQUARIUM
PROJECTED COST OF BALTIMORE NATIONAL AQUARIUM IN TORONTO (NOVEMBER 1984 CAN. DOLLARS)
GROSS FLOOR AREA : 143,071 SF
INDEX USED : 1978 MEANS (CITY ADJUSTMENT)
JULY 1978/OCTOBER 1984 TRENDS (ESCALATION)
NOVEMBER 30, 1984

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
1. GENERAL REQUIREMENTS	102.0	94.1	1.084	$1,350,000	$1,465,000	148.4	242.8	1.636	$2,395,000
2. SITEWORK	97.2	91.8	1.059	1,950,000	2,065,000	97.1	128.6	1.324	2,735,000
3. CONCRETE	102.0	95.4	1.069	5,000,000	5,345,000	140.8	280.4	1.991	10,645,000
4. MASONRY	102.8	91.0	1.130	175,000	200,000	182.7	298.9	1.636	325,000
5. METALS	96.2	93.9	1.024	1,040,000	1,065,000	173.9	255.1	1.467	1,560,000
6. WOOD & PLASTICS	108.1	97.9	1.104	350,000	385,000	113.4	175.8	1.550	595,000
7. MOISTURE PROTECTION	112.3	85.3	1.317	350,000	460,000	106.7	213.2	1.998	920,000
8. DOORS & WINDOWS	99.0	93.8	1.055	1,100,000	1,160,000	185.5	245.5	1.323	1,535,000
9. FINISHES	107.1	95.4	1.123	750,000	840,000	140.3	153.9	1.097	920,000
10-13. SPECIALTIES, ETC.	100.4	98.1	1.023	1,515,000	1,550,000	100.0	180.9	1.809	2,805,000
14. CONVEYING SYSTEMS	100.4	98.1	1.023	750,000	770,000	192.8	323.7	1.679	1,295,000
15. MECHANICAL	101.3	95.0	1.066	3,500,000	3,730,000	157.0	253.8	1.617	6,030,000
16. ELECTRICAL	100.9	93.5	1.079	1,150,000	1,240,000	162.7	256.5	1.577	1,955,000
				SUB - TOTAL (OCTOBER 1984 DOLLARS)					$33,715,000
				ESCALATION : OCTOBER 1984 - NOVEMBER 1984 (1%)					335,000
				TOTAL (NOVEMBER 1984 DOLLARS)					$34,050,000

(A) = MEANS 1978 TORONTO INDEX
(B) = MEANS 1978 BALTIMORE INDEX
(C) = (A) / (B) - ie CITY ADJUSTMENT INDEX (BALTIMORE - TORONTO)
(D) = ACTUAL BALTIMORE COSTS (JULY 1978 U.S. DOLLARS)
(E) = (C) x (D) - ie PROJECTED TORONTO COSTS (JULY 1978 CAN. DOLLARS)
(F) = TRENDS JULY 1978 TORONTO INDEX
(G) = TRENDS OCTOBER 1984 TORONTO INDEX
(H) = (G) / (F) - ie TORONTO ESCALATION INDEX FROM JULY 1978 - OCTOBER 1984
(I) = (E) x (H) - ie PROJECTED TORONTO COSTS (OCTOBER 1984 CAN. DOLLARS)

PROPOSED TORONTO AQUARIUM
BALTIMORE NATIONAL AQUARIUM FUNCTIONAL AREA COSTS
DOLLAR BASE : NOVEMBER 1984 CAN. DOLLARS
NOVEMBER 30, 1984

FUNCTIONAL AREA	GM2	$/M2	$
1. EXHIBITS AND PUBLIC CIRCULATION	5,034	5,380	27,085,000
2. LOBBY AND PUBLIC FACILITIES	800	1,725	1,380,000
3. AUDITORIUM	340	2,150	730,000
4. EDUCATION, RESEARCH AND CURATORIAL AREAS	619	1,850	1,145,000
5. ADMINISTRATION/STAFF	907	650	590,000
6. SERVICE, MAINTENANCE & FOOD SERVICE	890	1,050	935,000
7. MECHANICAL SYSTEMS	3,239	430	1,395,000
8. GENERAL BUILDING CIRCULATION	1,463	540	790,000
TOTALS	13,292	2,562	34,050,000

PROPOSED TORONTO AQUARIUM
PROJECTED BUILDING COST (PER FUNCTIONAL AREAS)
DOLLAR BASE : NOVEMBER 1984 CAN. DOLLARS
NOVEMBER 30, 1984

FUNCTIONAL AREA	GM2	$/M2	$
1. EXHIBITS AND PUBLIC CIRCULATION			
Interior Space	3,375	5,380	18,160,000
Exterior Space	1,115	3,815	4,255,000
Mechanical Space	1,420	430	610,000
2. LOBBY AND PUBLIC FACILITIES	873	1,725	1,505,000
3. AUDITORIUM	293	2,150	630,000
4. EDUCATION, RESEARCH AND CURATORIAL AREAS	771	1,850	1,425,000
5. ADMINISTRATION/STAFF	757	650	490,000
6. SERVICE, MAINTENANCE & FOOD SERVICE	757	1,050	795,000
7. MECHANICAL SYSTEMS	1,858	430	800,000
8. GENERAL BUILDING CIRCULATION	929	540	500,000
TOTALS	12,148	2,401	29,170,000

B

The following people were consulted, interviewed or corresponded with during the preparation of this report. We wish to thank them for their time and assistance.

Aquarium Steering Committee

Mayor Arthur Eggleton
Ms. Janice Kroetsch
Alderman Jack Layton
Alderman Joseph Piccininni
Mr. Stephan McLaughlin
Mr. Ted Davidson
Mr. Thomas De Journo
Mr. John Byrne

William Boytchuk ..... Alderman

David Reville ..... Alderman

Irma Pattison ..... Assistant to Alderman Boytchuk

Ed Negridge ..... Assistant to Alderman Boytchuk

Ted Davidson ..... City of Toronoto
Planning and Development Deptartment

Morris Fine ..... Metropolitan Toronto Planning Dept.
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Herb Pirk ..... City of Toronto
Dan Costea Department of Parks and Recreation

Naish McHugh ..... City of Toronto Planning & Development

William H. Wright ..... Victory Soya Mills

Dennis Stuber..... Canada Malting Co. Limited

Tom Chandler ..... Redpath Sugar

Chris Roberts ..... Metro Parks & Property

Walter Oster ..... Toronto Seaquarium Corporation

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Marilyn Brewer	
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Andrew Payton	Harbour Commissioners
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Beland Hondrick	Torstar Ltd.
William Grey	Ministry of Government Services
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Representative	Quebec Aquarium
Representative	Vancouver Aquarium
Dick Lyons	Boston Aquarium
Bill Flynn	Baltimore Aquarium
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Elmer Taylor	
Frank Flowers	Council on Animal Care
J.R. Geraci	Guelph University
Tom C. Curtis	Ontario Place Corporation
Lou Seiler	
Maury Mason	Greenpeace
Murray Thompson	GO-ALRT

c

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